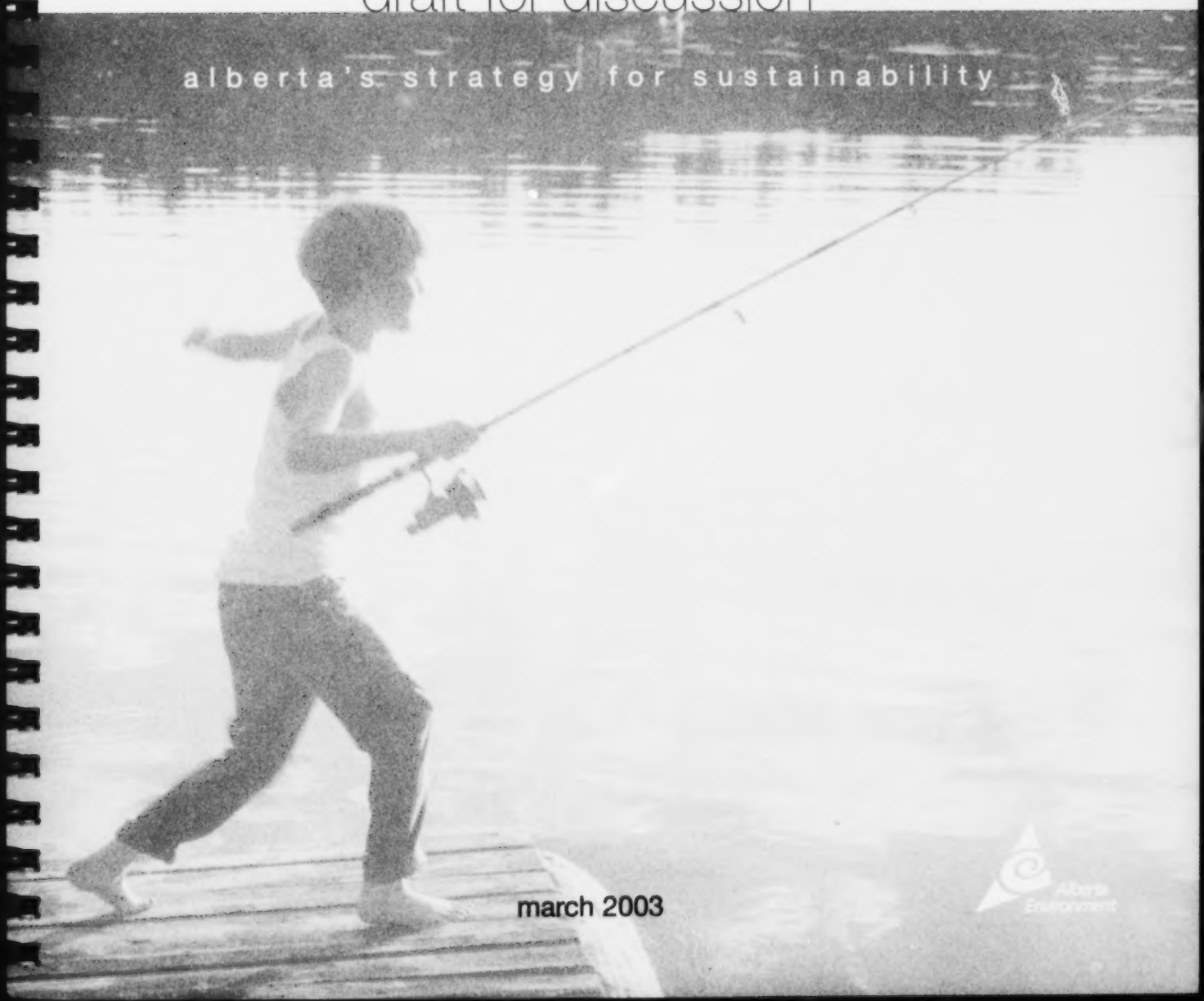
water for life

draft for discussion

alberta's strategy for sustainability



march 2003

Alberta Environment
Main Floor, Oxbridge Place
9820-106 Street
Edmonton, AB T5K 2J6
Tel: 780-427-6310
Fax: 780-422-4086
Email: waterforlife@gov.ab.ca
Web site: www.waterforlife.gov.ab.ca

ISBN No. 0-7785-2480-9 Pub No. I/935

103-06064/

draft for discussion

table of contents

the need for a provincial water strategy 5

setting the context 6
- process to date 6
- core principles 7
- a new model for water management & decision-making 8

key directions 10
- watershed approach 10
- partnerships 11
- knowledge and research 11
- water conservation 11
- allocation and use 12
- aquatic ecosystems 12
- water quality 12
- drinking water 13
- recommended actions 13

» watershed approach 14

» partnerships 22

» knowledge and research 28

» water conservation 32

» allocation and use 36

» aquatic ecosystems 40

» water quality 46

» drinking water 50

measuring success 56

next steps 57

glossary 58

all living things need water to survive.

In Alberta, our quality of life, and life itself, depends on having a healthy and sustainable water supply for the environment, for our communities and for our economic well-being.

The Government of Alberta is committed to the wise management of Alberta's water quantity and quality for the benefit of Albertans now and in the future.

The *Water for Life: Alberta's Strategy for Sustainability* draft for discussion represents the recommendations Albertans provided during the consultation process in 2002.

This draft strategy outlines practical and effective approaches to manage Alberta's water needs while maintaining the province's economic prosperity, and addressing environmental concerns.

The Alberta government is now inviting feedback from Albertans on the proposed approach and recommendations to help prepare the final plan on how best to manage Alberta's water resources.

BACKGROUND:

the need for a provincial water strategy

Alberta is facing significant pressures on its water resources.

Population growth, droughts and agricultural and industrial development are increasing demand and pressure on the province's water supplies, and the risk to the health and well-being of Albertans, our economy and our aquatic ecosystems.

Some of these water issues and vulnerabilities include:

- Health risks to 600,000 rural Albertans -- 20 per cent of the province's population -- who receive their drinking water from private or unregulated water systems
- Health risks over the safety and operation of small municipal water treatment plants
- Potential limitation to economic development due to extensive water use -- especially in the southern part of the province
- Potential risk to the health of aquatic ecosystems from over allocation and water quality degradation
- Loss of economic opportunity resulting from contamination of the province's surface and groundwater resources
- Effects of climate change on water supply
- Deterioration and aging of Alberta's existing public water management infrastructure

In the past, Alberta has been able to manage our water supply, while maintaining a healthy aquatic environment because there has been a relatively abundant, clean supply to meet the needs of communities and the economy.

However, fluctuating and unpredictable water supply in recent years has stressed the need to make some major shifts in our approach to managing this renewable, but finite, resource.

Water for Life: Alberta's Strategy for Sustainability is the Government of Alberta's new water management approach, and outlines specific strategies and actions to address these issues.

draft for
discussion

setting the context

Alberta began, in the fall of 2001, to develop a process to ensure that all issues and ideas for a provincial water strategy would be considered.

From its inception, Alberta's *Water for Life* strategy has been focused on four specific outcomes:

Safe, secure drinking water supply
Safe drinking water is vital to human health and to our communities. Whether people receive their drinking water from large municipal systems, smaller water treatment plants, or individual private systems, they need assurance of the safety and security of their drinking water.

Healthy aquatic ecosystems
Aquatic ecosystems include the full diversity of our rivers, streams, lakes and wetlands, as well as the groundwater systems that are linked to them. Aquatic ecosystems provide important ecological services (e.g. wetlands help improve water quality, reduce flood peaks and recharge groundwater aquifers). They also provide cultural, heritage and scientific values, as well as a rich diversity of plant and animal life, and support a variety of human uses, such as fisheries and recreation.

Reliable, quality water supplies for a sustainable economy
Water is an essential component of economic activity. Water is required during the production of many Alberta products. Water from lakes, rivers, and groundwater is used to grow agricultural crops; raise livestock; process food, pulp and petrochemicals; recover oil and for many other purposes. Therefore, there must be adequate amounts of quality water to sustain our economy and support future growth.

Knowledge to make effective water management decisions
Knowledge about the quality and quantity of Alberta's water supply is vital to the effective management of our water supply. There are three key pieces to an effective knowledge base - doing the inventory work to fill our information gaps; doing research to ensure we have the knowledge to address new and emerging issues; and ensuring the information is readily accessible by all parties involved in managing Alberta's water.

process to date

Because water is vital to all Albertans, in all areas and communities across the province, their opinions and ideas play a vital role in the development of a provincial water strategy.

An extensive provincial consultation process was held between November 2001 and June 2002, and consisted of three major components - ideas generation, public outreach and consultation, and a Minister's Forum on Water.

The first phase – ideas generation – was completed in early 2002 when a small, diverse group of Albertans provided the Government of Alberta with advice on water management in the province.

This ideas group identified the challenges associated with managing water in the province and several opportunities for improving it. A summary of their input and directions is available on-line at www.waterforlife.gov.ab.ca

These ideas provided the framework for the second stage of the process, a comprehensive public outreach and consultation, held in March and April 2002. During this phase, key stakeholders and Albertans responded to the initial directions proposed by the ideas group, as well as offering their own advice, opinions and ideas.

The Pooling Your Ideas Summary Report -- available on-line at www.waterforlife.gov.ab.ca -- outlines what Albertans had to say regarding water resources in the province.

The third stage in the strategy's consultation process was a Minister's Forum on Water, held in Red Deer in June 2002. The forum brought together over 100 experts and stakeholders to review the input from the public outreach and consultation process and discuss next steps and solutions.

The Minister's Forum on Water Summary Report -- available on-line at www.waterforlife.gov.ab.ca -- provides an overview of the input received at the Minister's Forum on Water.

Following the final report from the Minister's Forum, Alberta Environment began working with a cross-government working group to compile the ideas and feedback heard through all three levels of the consultation process and to develop a series of recommendations for action and a framework that will serve as the provincial water strategy.

This draft strategy outlines key directions, strategies and actions to manage Alberta's water resources more effectively.

Stakeholders and other Albertans are now being invited to provide comments on these recommendations to help shape the final strategy, to be released in Fall 2003.

core principles

In addition to confirming the strong need for a strategy for sustaining Alberta's water supply, a clear set of principles emerged from the consultation process.

These principles serve as the foundation for *Water for Life* and its recommendations:

- **All Albertans must recognize there are limits to the available water supply.**
- **Alberta's water resources must be managed within the capacity of individual watersheds.**
- **Citizens, communities, industry and government must share responsibility for water management in Alberta, and work together to improve conditions within their local watershed.**
- **Knowledge of Alberta's water supply and quality is the foundation for effective decision-making.**
- **Albertans must become leaders at using water more effectively and efficiently, and will use and re-use water wisely and responsibly.**
- **Alberta will preserve the "First-in-time, first-in-right" principle for granting and administering water allocations, but water allocations will be transferable within basins to ensure societal demands and needs can be met.**

draft for discussion

- **Where water supply is limited, water allocations can be transferred to provide security of supply, and accommodate new users.**
- **Healthy aquatic ecosystems are vital to a high quality of life for Albertans and must be protected.**
- **Groundwater and surface water quality must be protected in pursuing economic and community development.**
- **Alberta will continue to be a leader in drinking water quality and standards to ensure Albertans have safe, secure drinking water.**

a new model for water management & decision-making

A common theme throughout the consultation process was that there is a growing need to engage all aspects of society, not just governments, in water management and decision-making. Citizens, communities, industry and government must work together to ensure that the right decisions are made, and to ensure that our water resources are being used in a safe and sustainable manner.

Therefore, one of the key recommendations in *Water for Life* is a shift to shared governance through a network of partnerships, use of outcome-based approaches and collaboration in delivery of services.

While the Government of Alberta, led by Alberta Environment, will remain accountable and will continue to oversee water management activities in the province, *Water for Life* identifies three formal working levels of partnerships that are integral to achieving stewardship of our water resources:

Provincial Water Advisory Council
A multi-stakeholder Provincial Water Advisory Council will be established to guide the overall implementation of *Water for Life*.

The Council will also provide policy advice to government, similar to the way the Clean Air Strategic Alliance (CASA) does on air issues.

shared governance of water in alberta

Government of Alberta
(lead ministry: Alberta Environment)
ADVICE/SUPPORT/INFORM
ADVICE/REPORT
SUPPORT
Provincial Water Advisory Council » Multi-stakeholder with broad representation from provincial government departments, municipal government, stakeholders and environmental organizations.
SUPPORT
MENTOR
INFORM
Watershed Advisory Councils » Multi-stakeholder with broad representation from within the watershed (government, industry stakeholders, other water users and environmental organizations).
SUPPORT
MENTOR
INFORM
Community-based Watershed Protection Groups » Volunteer membership from local citizens with support from government, business and industry.

draft for discussion

The Clean Air Strategic Alliance is a stakeholder partnership of government, industry and advocacy groups, that has been given shared responsibility for strategic air quality planning, organizing, and coordinating resources, and evaluation of results in Alberta through a collaborative process.

Because proactive water management involves understanding and responding effectively to issues, the Provincial Water Advisory Council will investigate and report on existing and emerging issues such as beneficial use, conservation opportunities, and market and pricing mechanisms. Other responsibilities will include setting priorities for water research and consulting with Albertans on water issues on an on-going basis.

The Provincial Water Advisory Council will provide an overall, broad perspective and help to ensure outcomes are achieved across the province.

Watershed Advisory Councils

Water for Life adopts a watershed approach to management that focuses on a geographic region. This approach also ensures that those people who best understand and are immediately affected by water issues can help find solutions to address them.

To accomplish this, the government will support the establishment of a series of Watershed Advisory Councils to involve communities and stakeholders in watershed management. These councils will be multi-stakeholder in nature and receive guidance and mentoring from the Provincial Water Advisory Council. In addition, Watershed Advisory Councils will have membership on the Provincial Council in order to represent regional watershed issues and priorities.

Watershed Advisory Councils will lead watershed planning, develop best management practices, foster stewardship activities within the watershed, report on the state of the watershed, and educate users of the water resource.

Watershed:
The area that drains to a common waterway. Watersheds come in all shapes and sizes, and includes rivers, streams, lakes or wetlands.

Community-based Watershed Protection Groups

Albertans have already demonstrated their concern for the local watersheds that they live in. Over 30 community-based watershed protection groups have formed across the province. These groups are made up of volunteer citizens, often supported by the Alberta Environmentally Sustainable Agriculture Council, local businesses and industries, who have taken the initiative to protect their local creek, stream, stretch of river, or lake. The groups and individuals have been proactive and continue to develop on-the-ground solutions to ensure the protection of their specific watersheds.

Therefore, these groups will continue to play a vital role in water management in the province. The community-based Watershed Protection Groups will have membership on Watershed Advisory Councils. The network of these community-based groups will receive guidance, technical advice and mentoring from the Watershed Advisory Council and participate in broader watershed initiatives.

For more information on watershed groups in Alberta, visit **albertawatersheds.org**

draft for discussion

key directions

Within the context of the new model for partnership and decision-making, combined with the guiding principles, eight key strategic directions are outlined by this water strategy.

- **Adopt a watershed approach to management and decision-making.**
- **Involve all Albertans in managing provincial water supplies and resources.**
- **Increase our knowledge and understanding about Alberta's water resources.**
- **Increase water conservation activities.**
- **Allocate water resources more effectively.**
- **Protect Alberta's aquatic ecosystems.**
- **Protect Alberta's surface and ground water quality.**
- **Ensure all Albertans have safe and secure drinking water.**

Each of these key directions is supported by a series of strategies, both new initiatives and actions already underway or being enhanced, that will shape the future of water management and decision-making in Alberta.

watershed approach:

Adopt a watershed approach to management and decision-making.

New:

- Develop and implement a watershed and source protection framework that addresses cumulative effects on a watershed scale.
- Encourage new development to locate where there is sufficient assurance of a quality water supply.
- Report on the condition of Alberta's watersheds.

Enhance:

- Support improved water conservation and sound watershed management.
- Implement the *Alberta Flood Risk Management Action Plan*.

Continue:

- Continue to meet interprovincial and international water management obligations.
- Implement the *Agriculture Drought Risk Management Plan*.

draft for discussion

partnerships

Involve all Albertans in managing provincial water supplies and resources.

New:

- Establish a multi-stakeholder Provincial Water Advisory Council to advise government, guide the implementation of the Water Strategy and investigate and report on existing and emerging water issues (e.g. beneficial use, conservation opportunities, market and pricing mechanisms).
- Encourage and support municipal governments to take a leadership role in protecting their watersheds.

Enhance:

- Encourage and support the establishment of Watershed Advisory Councils to involve communities and stakeholders in watershed management.
- Support community-based Watershed Protection Groups on the implementation of local water management solutions.

knowledge and research

Increase our knowledge and understanding about Alberta's water resources.

New:

- Establish a research program to obtain the understanding required to address new and emerging water management issues.
- Establish a public awareness and education program on water.

Enhance:

- Increase and expand our knowledge of Alberta's water resource and ensure this information is made available to decision-makers and the public.

water conservation

Increase water conservation activities.

New:

- Develop and implement a broad-based water conservation program in Alberta.
- Set and report on the achievement of water conservation targets in partnership with Watershed Advisory Councils.

Enhance:

- Improve monitoring activities on the use of water in Alberta.

draft for discussion

allocation and use

Allocate water resources more effectively.

New:

- Implement, and monitor the application of, water allocation transfers within each river basin in Alberta thereby allowing transfers to facilitate beneficial use.

Enhance:

- Manage groundwater using science-based methods to ensure aquifer sustainability.
- Ensure proper levels of funding to achieve long-term sustainability of Alberta's publicly funded water management infrastructure.

Continue:

- Continue to manage Alberta's water resources based on the principle of "First-in-time, first-in-right", using all of the tools within the *Water Act*.

aquatic ecosystems

Protect Alberta's aquatic ecosystems.

New:

- Determine the current condition of wetlands in Alberta and establish regional wetland objectives.

Enhance:

- Determine the ecological requirements of the aquatic ecosystems of Alberta's rivers.
- Set objectives for aquatic protection in Alberta's rivers after full consideration of ecological requirements, economic values and social values in collaboration with Watershed Advisory Councils.
- Monitor and report on the health of Alberta's aquatic ecosystems.
- Determine the aquatic ecosystem requirements of lakes as needs emerge.

water quality

Protect Alberta's surface and ground water quality.

Enhance:

- Establish a Water Quality Assurance Initiative for Alberta's surface and groundwater.
- Undertake land-based activities in a manner to protect watersheds.
- Adopt a pollution prevention approach and strive for "zero discharge" of contaminants.
- Monitor and report on the quality of water in Alberta's watersheds.

draft for discussion

drinking water

Ensure all Albertans have safe and secure drinking water.

New:

For Regulated Systems:

- Determine the full cost of drinking water so that consumers and governments can make informed decisions.

For Non-Regulated Systems:

- Provide accurate, accessible and clear information to Albertans on private systems so that they can make informed decisions on how to assure the quality and safety of their drinking water.

Enhance:

For Regulated Systems:

- Continue to adopt drinking water standards and monitoring processes that protect the health of Albertans.
- Improve risk management of potential threats to drinking water safety.
- Support and facilitate regional delivery of drinking water through partnerships with the private sector and large municipalities.

recommended actions

The following provides additional details and explanations of the proposed strategies, along with specific actions, either underway or proposed, to support those strategies.

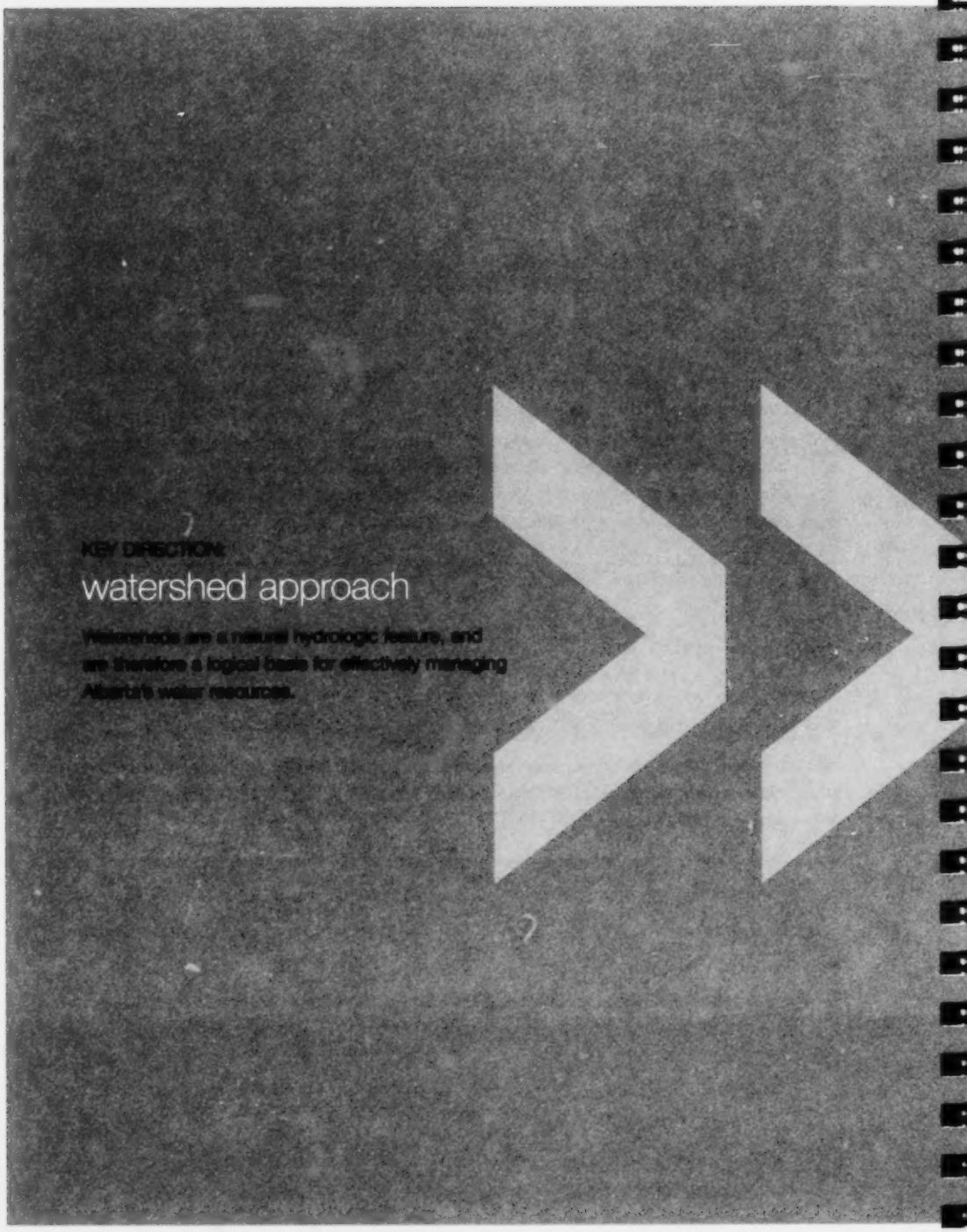
In some cases, the details of proposed strategies and related actions will be determined through the stakeholder consultations and public discussion of this draft strategy in spring 2003, and through the implementation of the strategy.

KEY DIRECTION:

Watershed Approach

Watersheds are a natural hydrologic feature, and are therefore a logical basis for effectively managing Alberta's water resources.

draft for
discussion



KEY DIRECTION:

watershed approach

Watersheds are a natural hydrologic feature, and are therefore a logical basis for effectively managing Alberta's water resources.

draft for discussion

Each watershed in Alberta is unique. The climatic conditions that determine the amount of water nature provides and the characteristics of aquatic ecosystems vary dramatically across Alberta. Social and economic pressures are also different within each watershed. The wise and effective use of Alberta's water resources is best managed within the capacity of individual watersheds.

All aspects of water management -- including water quality, water quantity, aquatic ecosystems, water use, water allocation, water storage, groundwater, wetlands and economic and social benefits of water -- are integrated within a watershed. Therefore effective water management is achieved by understanding and considering the entire watershed.

Watershed:
The area that drains to a common waterway. Watersheds come in all shapes and sizes, including rivers, streams, lakes or wetlands.

STRATEGY » Develop and implement a watershed and source protection framework that addresses cumulative effects on a watershed scale.

The water flowing from a watershed or within an aquifer becomes the water supply for a community, individual farmstead, business or aquatic ecosystem. Natural events and human activities that take place within a watershed have an impact on the quality of the water.

Albertans want the quality of their water supplies protected. Protecting water quality proactively reduces risks and is more efficient than treating the water later.

Growth and development impact both the quality and quantity of our water. It is becoming increasingly important to integrate the planning and management of water quality and quantity with particular emphasis on source protection.

> Source water protection based on watershed management involves a coordinated approach among stakeholders to develop short- and long-term plans to prevent, minimize or control potential sources of pollution or enhance water quality where necessary. Source water includes surface water, aquifers and groundwater recharge areas.
>
> (From *Source to Tap*, Canadian Council of Ministers of the Environment)

Watershed and source protection will be an integral part of watershed planning and management in Alberta.

ACTIONS

- » Develop a watershed and source protection framework in collaboration with Watershed Advisory Councils, Watershed Protection Groups, municipalities and stakeholders.
- » Prepare watershed and source protection plans during the appropriate phases of watershed planning initiatives.
- » Encourage communities with drinking water systems to prepare, or participate in the preparation of, source protection plans.
- » Support and encourage the establishment of Watershed Protection Groups, such as the Crowfoot Creek Watershed Group and the Pine Lake Restoration Society.

draft for
discussion

STRATEGY » Encourage new development to locate where there is sufficient assurance of quality water supply.

Many factors are considered when choosing a location for a new development – such as access to markets, transportation, skilled work force, raw materials and power supply.

To date in Alberta, the availability of a quality water supply has not been one of the major factors influencing the location of new developments.

As watersheds approach the limit of their available supply of quality water, it becomes increasingly important for new developments to assess all limitations, including water supply.

In the past, the security of the water supply was ensured by the construction of reservoirs and the delivery of water to the location of the new development.

In the future, the availability of a quality water supply will have to be considered along with all other factors in determining the location of new developments. It may be more cost effective to deliver other raw materials to a location that has an abundant water supply than it is to deliver water to an area with a limited water supply, but an abundance of raw materials.

The availability of a quality water supply will be considered as one of the major factors influencing the location of new developments.

ACTIONS

- Evaluate the extent of the economic impact of water as a limiting factor in choosing the location of new developments in various regions of Alberta.
- Evaluate, at a conceptual level, the cost of water storage and diversion as compared to the potential economic impact of water as a limiting factor in choosing the location of new developments in various regions of Alberta.
- Encourage new developments that have large water requirements to locate in areas of Alberta that have an abundant quality water supply.

STRATEGY » Report on the condition of Alberta's watersheds.

In the consultation process, Albertans stated they want information on the condition of Alberta's watersheds. Albertans want to understand the quality of the surface and ground water, the health of rivers, lakes and wetlands, the use of the water and the available supply.

The condition of each of these elements and the situations influencing their condition are different for each watershed.

Effective reporting of various elements of the water resource within each watershed will enable Albertans within those watersheds to make decisions on how to manage their impacts on the watershed.

draft for discussion

Stakeholders, the public and other partners will play an integral role in selecting, monitoring and reporting on the status of the appropriate watershed quality and health indicators and associated targets to all Albertans.

ACTIONS

- Develop a protocol for assessing the condition of a watershed, including selecting indicators and establishing targets for each indicator.
- Monitor the selected indicators, evaluate the collected data and prepare state of the watershed reports.
- Report on the conditions of Alberta's watersheds to Albertans.

STRATEGY » Support improved water conservation and sound watershed management.

Each watershed in Alberta has a variable, yet finite, water supply. The amount of water flowing in a watershed varies throughout the year (high spring runoff and low winter flows) and from year to year (flood of 1997 and drought of 2001).

There are many demands on the water within a watershed including domestic, industrial, recreational and aquatic ecosystems. In many of the watersheds in southern Alberta, and some in central Alberta, the full amount of reasonably available water for consumption has been allocated to human and economic uses.

Sound water management is based on achieving the appropriate balance between the social, environmental and economic water uses within a watershed.

Albertans must recognize the limits to the available water supply and must ensure that they are using this water in the most efficient manner possible.

Improved water conservation and living within the capacity of the watershed are the cornerstones of the watershed approach.

A renewed emphasis will be placed on watershed planning, and water conservation will be a core element of this planning.

A Water Management Plan must include the following:

- A summary of the issues considered.
- A description of the area in which the Water Management Plan applies.
- A summary of the information assembled as part of the planning process.
- The relationship of the Water Management Plan to regional strategies or other planning initiatives.
- The recommended options and strategies to address the issues.
- A list of performance monitoring requirements.

draft for
discussion

ACTIONS

- Complete the South Saskatchewan River Basin Planning Program in partnership with the existing Basin Advisory Committees.
- Initiate and complete the North Saskatchewan, Cold Lake-Beaver River, Battle River and Lesser Slave Lake Watershed Plans in partnership with existing or newly formed Watershed Advisory Councils.
- Initiate other watershed and sub-watershed planning initiatives as issues, stakeholder advice and funding availability dictate.
- Investigate and evaluate water storage during the appropriate phases of watershed planning initiatives.
- Continue the practice of limiting interbasin transfers between the seven major river basins as outlined in the *Water Act*.

STRATEGY » Implement the Alberta Flood Risk Management Action Plan.

Flooding is a natural occurrence within watersheds. Floods can cause extensive damage to personal property and public infrastructure.

Alberta has developed a *Flood Risk Management Action Plan* that addresses floodplain mapping, flood prediction and warning, land use planning, flood protection and disaster assistance.

Alberta has also been working with the other provinces, territories and the federal government to develop a national flood risk management program.

The development and implementation of both the provincial and national flood risk management action plans will ensure that future flood damage in Alberta is reduced.

ACTIONS

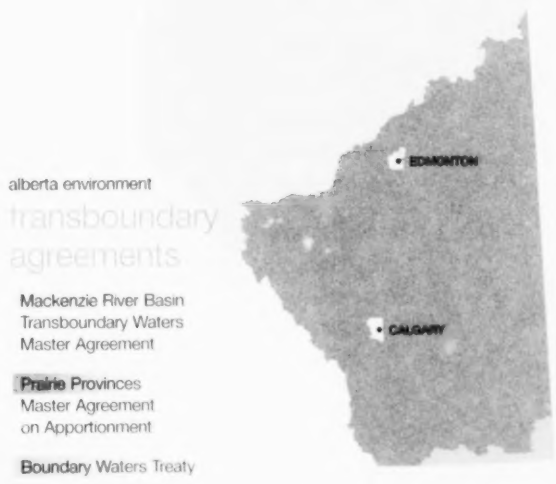
- Prepare flood risk maps for urban flood risk areas in the province.
- Identify priority rural flood risk areas for flood risk mapping.
- Designate flood risk areas as per section 96 of the *Water Act*.
- Expand Alberta's flood forecasting network to provide consistent flood warnings throughout the province.
- Develop guidelines to reduce future flood damages to new and existing developments.
- Assist local governments with flood risk education initiatives.
- Continue to co-chair and support the development of a national flood risk management program.

draft for discussion

STRATEGY » Continue to meet interprovincial and international water management obligations.

Managing water within a watershed approach includes the portions of the watersheds that are in neighbouring jurisdictions. For example:

- In the **Milk River watershed**, Alberta receives water from the United States and returns flow back to the United States. The International Boundary Waters Treaty between Canada and the United States governs how this water is shared.
- In the **North and South Saskatchewan and Cold Lake-Beaver River watersheds**, the water originates in Alberta and flows into Saskatchewan. The Prairie Provinces Master Agreement on Apportionment (Apportionment Agreement) between Alberta and Saskatchewan governs how this water is shared.
- In the **Mackenzie watershed which includes the Athabasca, Peace and Hay watersheds**, Alberta receives water from British Columbia and Saskatchewan and then it flows north into the Northwest Territories. Currently the Mackenzie River Basin Transboundary Waters Master Agreement sets the foundation for cooperative water management and for the formation of bilateral water agreements between neighbouring jurisdictions.



Alberta must receive a fair share of quality water from its upstream neighbours and, in turn, must pass on a fair share of quality water to its downstream neighbours.

The establishment and implementation of transboundary agreements will ensure entire watersheds, including portions within Alberta, are managed within a watershed approach.

ACTIONS

- Continue to administer and operate the water management system in Alberta to meet the Apportionment Agreement with Saskatchewan.
- Continue to administer and operate the water management system in Alberta to meet the International Boundary Waters Treaty with the United States.
- Negotiate individual bilateral water management agreements with each of Northwest Territories, British Columbia and Saskatchewan for the Mackenzie River Basin.
- Report to Albertans on the achievement of transboundary water management obligations.

STRATEGY » Continue to meet interprovincial and international water management obligations.

Managing water within a watershed approach includes the portions of the watersheds that are in neighbouring jurisdictions. For example:

- In the **Milk River watershed**, Alberta receives water from the United States and returns flow back to the United States. The International Boundary Waters Treaty between Canada and the United States governs how this water is shared.
- In the **North and South Saskatchewan and Cold Lake-Beaver River watersheds**, the water originates in Alberta and flows into Saskatchewan. The Prairie Provinces Master Agreement on Apportionment (Apportionment Agreement) between Alberta and Saskatchewan governs how this water is shared.
- In the **Mackenzie watershed which includes the Athabasca, Peace and Hay watersheds**, Alberta receives water from British Columbia and Saskatchewan and then it flows north into the Northwest Territories. Currently the Mackenzie River Basin Transboundary Waters Master Agreement sets the foundation for cooperative water management and for the formation of bilateral water agreements between neighbouring jurisdictions.

Alberta must receive a fair share of quality water from its upstream neighbours and, in turn, must pass on a fair share of quality water to its downstream neighbours.

The establishment and implementation of transboundary agreements will ensure entire watersheds, including portions within Alberta, are managed within a watershed approach.

ACTIONS

- Continue to administer and operate the water management system in Alberta to meet the Apportionment Agreement with Saskatchewan.
- Continue to administer and operate the water management system in Alberta to meet the International Boundary Waters Treaty with the United States.
- Negotiate individual bilateral water management agreements with each of Northwest Territories, British Columbia and Saskatchewan for the Mackenzie River Basin.
- Report to Albertans on the achievement of transboundary water management obligations.

STRATEGY » Implement the Agriculture Drought Risk Management Plan.

Alberta's agriculture industry suffers serious impact from recurring droughts. Responding to drought crises on an ad hoc basis results in costly, inconsistent and short-term relief.

In the mid-1980s, industry voiced a need for a "risk management" approach to drought. In response, Alberta Agriculture, Food and Rural Development and Alberta Environment worked with the federal government and the Agriculture Financial Services Corporation to develop the Agriculture Drought Risk Management Plan, which focuses on three areas: drought preparedness; drought reporting and drought response.

It is the first drought management plan to be implemented in Canada.

The *Agriculture Drought Risk Management Plan* allows for an immediate and effective response during a drought crisis and reduces drought impacts over the long-term through planning and preparedness.

Implementing the plan will also help agricultural producers be more prepared and less vulnerable to drought.

Complementing this plan, the Alberta Drought Management Committee, comprised of government partner agencies and municipal representatives, will continue to ensure that drought preparedness information and drought response actions are suited to the needs of drought affected areas.

ACTIONS

- Develop and maintain DroughtNet -- a series of real-time, year-round weather monitoring stations in agricultural regions of Alberta.
- Develop scientific drought indicators to facilitate monitoring, reporting and determining drought severity.
- Prepare timely maps on soil moisture conditions, water supplies, growing conditions, and projected drought conditions.
- Package and deliver information on drought preparedness including an inventory of available programs to help producers drought-proof their farms.
- Meet regularly with government partner agencies and drought affected municipalities to ensure proactive, coordinated and effective actions.
- Report regularly on drought conditions and industry issues.
- Recommend appropriate options to respond to drought such as grasshopper control, on-farm water development grants, disaster loan programs, etc.

notes

KEY DIRECTION:

Partnerships

All Albertans use and affect the water resources within their watershed. Therefore, citizens, communities, industries and governments share responsibility for the wise use and sustainability of their watersheds.

draft for
discussion

KEY DIRECTION:
partnerships
All Albertans use and affect the water resources within their watershed. Therefore, citizens, communities, industries and governments share responsibility for the wise use and sustainability of their watersheds.

draft for
discussion

From individual homes with their own well, to large communities, industries and irrigation districts, water is withdrawn from the environment and in many cases returned with its quality degraded.

Albertans must work together to set objectives for watersheds, identify issues, monitor the condition of watersheds and continuously adjust their use of water and the activities that affect water and the surrounding landscape.

Throughout the public consultation, Albertans expressed a strong interest in having a significant role in managing Alberta's water resource, and in directly influencing policy and legislation development, tracking and reporting on the condition of watersheds and influencing change within watersheds.

STRATEGY » Establish a multi-stakeholder Provincial Water Advisory Council to advise government on existing and emerging water management issues.

Establishing a Provincial Water Advisory Council, with membership from a broad cross-section of stakeholders and government departments, will provide a focus for improving water management in Alberta.

A Provincial Water Advisory Council will provide a forum where all stakeholders have the opportunity to share their knowledge and experience and discuss their thoughts and ideas, identify water issues, investigate potential solutions and provide advice to government.

The Council will also help raise the awareness of water issues and provide a forum for gathering the thoughts and ideas of Albertans.

ACTIONS

» Work with stakeholders to establish a Provincial Water Advisory Council, including identifying membership, terms of reference and accountability, that will:
- Guide the implementation of *Water for Life* and report to Albertans on its progress
- Investigate and report on existing and emerging water issues (e.g. beneficial use, conservation opportunities, market and pricing mechanisms)
- Identify water research priorities for Alberta
- Consult with Albertans on water issues
- Provide advice to government, stakeholders and the public

STRATEGY » Encourage and support municipal governments to take a leadership role in protecting their watersheds.

Many of the challenges facing watersheds are due to the pressure of industrial, agricultural and community development, as any changes on the landscape pose challenges in the watershed.

Because municipal governments play a key decision-making role in these activities at a local level, their involvement and leadership is vital in a successful watershed management system.

draft for
discussion

The efforts of Watershed Advisory Councils and Watershed Protection Groups will assist municipal governments in protecting their watersheds.

ACTIONS

- Encourage municipalities to participate in watershed initiatives.
- Establish working relationships with interested municipalities to share information during development approval processes to ensure the best possible decisions can be made.

STRATEGY » Encourage and support the establishment of Watershed Advisory Councils to involve communities and stakeholders in watershed management.

Since watersheds transcend political, social and economic boundaries, for Alberta to succeed in improving water management by implementing a watershed approach, stakeholders within each watershed must be involved.

As each watershed has specific water management issues and opportunities to address those issues, Albertans believe that stakeholders within a watershed are best equipped to set the future direction for water management in each watershed. They also believe that the greatest commitment to the common good of a watershed is achieved when stakeholders themselves commit time and energy for the future of the watershed.

Supporting, encouraging and facilitating the establishment of Watershed Advisory Councils will enable stakeholder involvement at a watershed level.

In partnership with government, Watershed Advisory Councils can assist in achieving watershed-specific initiatives, such as watershed planning and state of the watershed reporting. They can also achieve their own goals in the stewardship of a watershed by working on specific actions with all stakeholders.

Watershed Advisory Councils will have membership on the Provincial Water Advisory Council to share information, provide watershed-specific experience into the evaluation of water issues and receive advice and mentorship.

draft for discussion

ACTIONS

» Develop a framework for Watershed Advisory Councils in consultation with existing watershed groups, such as the Bow River Basin Council, North Saskatchewan Watershed Alliance and Oldman River Basin Water Quality Initiative, and other interested stakeholders. This framework will outline the roles of the Watershed Advisory Councils and establish the partnership between the Watershed Advisory Councils and government. The general area of responsibility of Watershed Advisory Councils include:
  - Developing water management plans in partnership with government
  - Reporting on the conditions of Alberta's watersheds to Albertans
  - Identifying priority water issues within the watershed
  - Identifying knowledge gaps and research priorities of the watershed
  - Promoting best management practices
  - Educating water users within the watershed

» Encourage and facilitate the establishment of Watershed Advisory Councils in each of the Milk, Oldman, Bow, Red Deer, North Saskatchewan, Cold Lake-Beaver River, Athabasca and Peace watersheds.
  - In watersheds where effective groups already exist, work with these groups to ensure broad stakeholder participation.
  - In watersheds where groups may have been established for other issues, approach these groups to explore the opportunity for evolving into a Watershed Advisory Council.
  - In watersheds where no groups exist, work with stakeholders to establish Watershed Advisory Councils.

» Encourage and facilitate the establishment of Watershed Advisory Councils for other watersheds, such as the Lesser Slave Lake Watershed, on an as needed and issue specific basis.

» Partner with Alberta-Pacific Forest Industries, Ducks Unlimited Canada and other stakeholders to establish a watershed-based conservation initiative for the Al-Pac Forest Management Agreement Area.

STRATEGY » Support community-based Watershed Protection Groups on the implementation of local water management solutions.

Small watersheds are the focal point of many communities in Alberta, as they provide drinking water, recreational opportunities, and the foundation for a way of life.

In the past 10 years, over 30 community-based Watershed Protection Groups have been established in Alberta. Their primary goal has been to improve and protect the water quality of their local streams, lakes and groundwater aquifers. This has been achieved by learning about the current condition of watersheds, identifying potential risks and promoting local solutions.

With the support of the Alberta Environmentally Sustainable Agriculture Program and Alberta Environment, these community-based groups have helped promote an understanding and appreciation of watersheds by Albertans, which in turn is resulting in improvements within specific watersheds.

draft for
discussion

The Alberta Environmentally Sustainable Agriculture Program is a provincial program designed to facilitate the development of new information and science, transfer new technology and information into the hands of farmers, ranchers and processors, and monitor the impact of the agriculture industry on soil and water quality.

Building on that success, supporting Watershed Protection Groups is a key element of the *Water for Life* strategy.

Watershed Protection Groups will not report to the Watershed Advisory Councils, but will share information, provide watershed-specific experience into planning and reporting for the greater watershed and receive advice and mentorship.

ACTIONS

- Support community-based Watershed Protection Groups through the Alberta Environmentally Sustainable Agriculture Council.
- Provide technical advice and assistance to community-based Watershed Protection Groups as appropriate.
- Encourage community-based Watershed Protection Groups to participate within the Watershed Advisory Councils on issues of common interest within the greater watershed.
- Continue to support and deliver local education and stewardship programs, such as the "Cows and Fish" riparian habitat management program and the Environmental Farm Plan program.

draft for
discussion

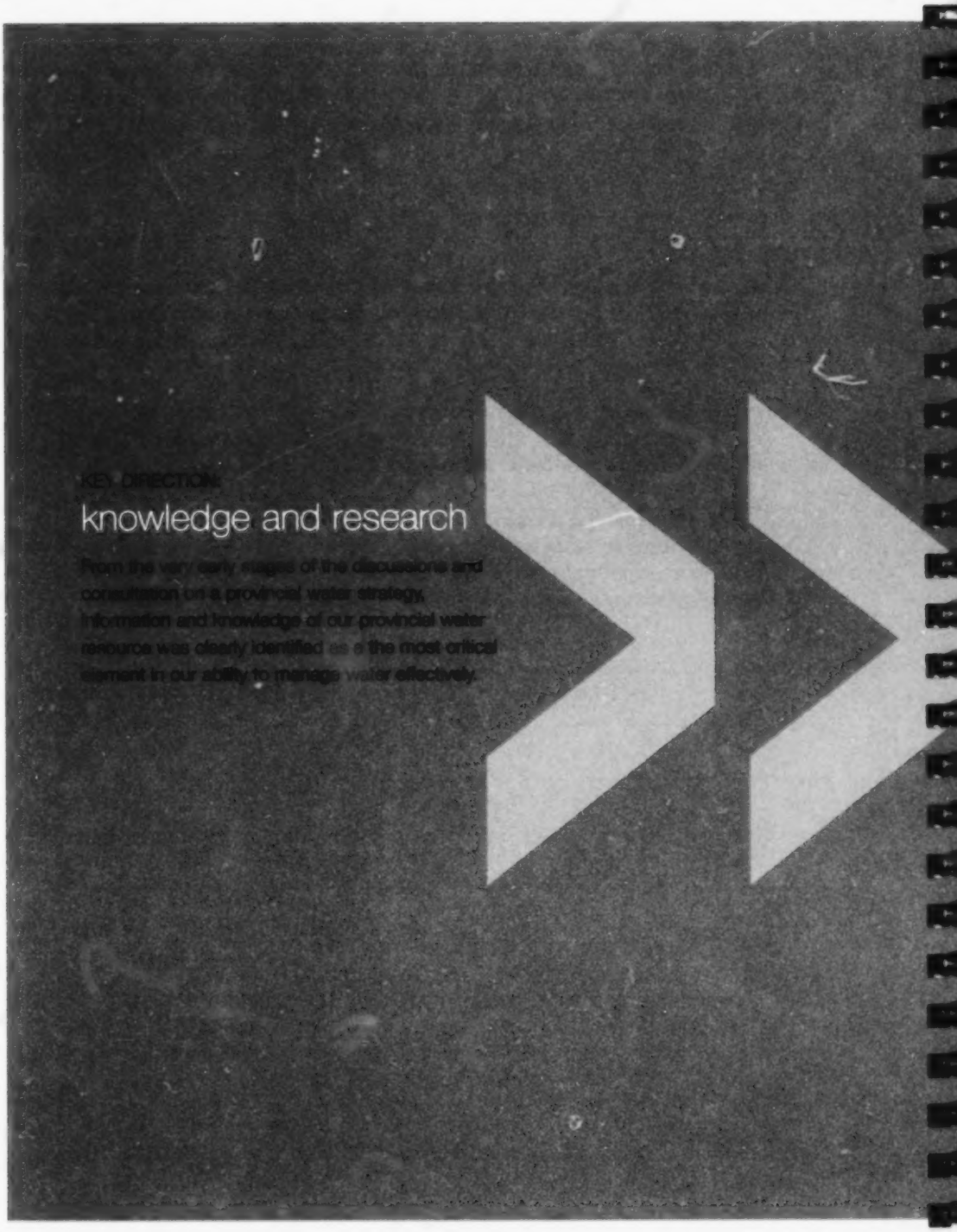
notes

KEY DIRECTION:

knowledge and research

From the very early stages of the discussions and consultation on a provincial water strategy, information and knowledge of our provincial water resource was clearly identified as a the most critical element in our ability to manage water effectively.

draft for
discussion


KEY DIRECTION:
knowledge and research
From the very early stages of the discussions and consultation on a provincial water strategy, information and knowledge of our provincial water resource was clearly identified as a the most critical element in our ability to manage water effectively.

draft for discussion

Knowledge consists of two parts -- knowledge of Alberta's water resources, and understanding of emerging water issues and opportunities – as both are required to enable groups and individuals to make effective management decisions.

STRATEGY » Establish a research program to obtain the understanding required to address new and emerging water management issues.

It is relatively easy to measure the current conditions within a watershed and make this information available to those who make water management decisions. However, it is not as easy to predict the condition within a watershed in the future.

In order to predict patterns for the future, we must have a good understanding of the conditions in the past, the processes going on in the watershed in the present, and the influences that will change the watershed in the future. It is also important to have a good understanding of how we can adapt to future supply patterns, and of the new technologies that can help improve the management of the water supply.

Establishing and implementing a water research program will provide the knowledge necessary to address future water challenges.

ACTIONS

- Implement a coordinated water research program with the various research institutions or organizations in Alberta.
- Identify the research priorities for provincial watersheds, including, but not limited to:
  - Ecological requirements for aquatic protection
  - Drinking water treatment and technology development
  - Water quality conditions, causes, and solutions
  - Wastewater treatment and technology development
  - Future water supply and demand conditions
  - Industrial ecology (use and flow of water in products, processes, industrial sectors, and economies)
  - Water conservation technologies

STRATEGY » Establish a public awareness and education program on water.

Throughout the public consultation, education was identified as an essential tool for raising public awareness and understanding of water quality and quantity issues.

Education is effective in promoting and motivating behavioral change and in building a stewardship ethic for water.

Any public awareness and education program must be directed to all water users including individuals, municipalities, and industries to help improve understanding, conservation and wise use of water.

ACTIONS

- Establish an on-going Water Education Institute targeted at Alberta teachers to build capacity for addressing water issues in the formal school system.
- Develop interpretive and educational programs on water management and wetlands to be delivered in partnership through the Bow Habitat Station and other organizations.
- Develop a broad-based water conservation initiative to educate Albertans on the importance of water, the need to use it wisely and opportunities for improved efficiencies.

STRATEGY » Increase and expand our knowledge of Alberta's water resource and ensure this information is made available to decision-makers and the public.

Knowledge of the amount of water that is underground in aquifers and flowing in rivers, as well as knowledge about the quality of this water and the requirements of healthy aquatic ecosystems, is needed to make decisions on how to manage our water supplies.

Timely, accurate information, available to all Albertans in a form they can understand and use, will improve the management of Alberta's water resource and support the watershed approach.

While we already have knowledge and information about our surface and ground water in some parts of the province, there are still gaps in our information and understanding in other areas. Completing the inventory work and filling these gaps is essential to good decision-making.

ACTIONS

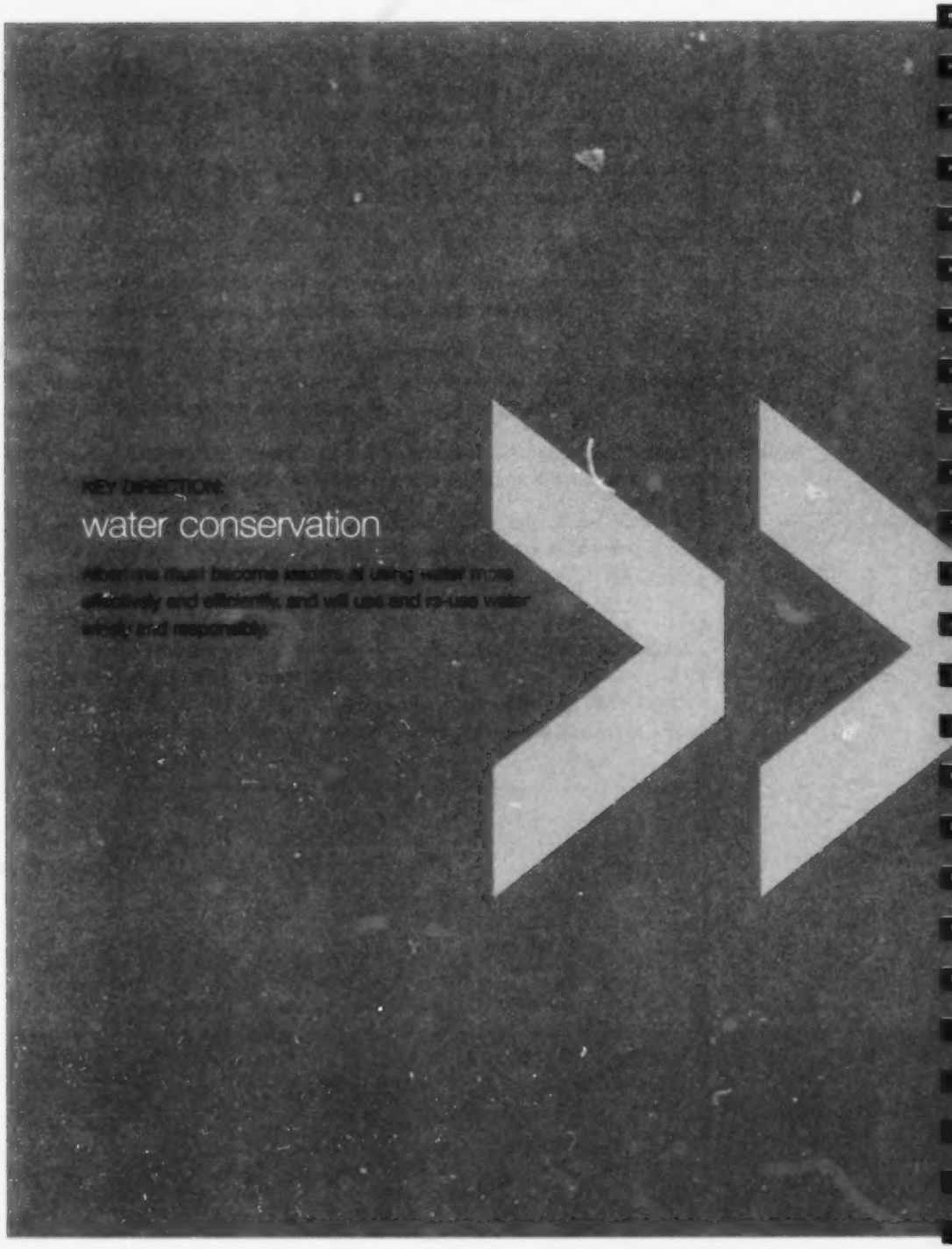
- Determine Alberta's surface water supply (particularly in northern river basins).
- Determine Alberta's groundwater supply.
- Determine the quality of Alberta's surface and groundwater (see Water Quality).
- Determine the requirements of Alberta's aquatic ecosystems (see Aquatic Ecosystems).

draft for
discussion

KEY DIRECTION:

Albertans must become leaders at using water more effectively and efficiently, and will use and re-use water wisely and responsibly.

draft for
discussion


KEY DIRECTION:
water conservation
Albertans must become leaders at using water more
effectively and efficiently, and will use and re-use water
wisely and responsibly.

draft for discussion

Over the past one hundred years, water has been withdrawn from Alberta's rivers, lakes and aquifers for a variety of purposes.

But within each watershed there is a limited amount of water that can be withdrawn while still maintaining a healthy aquatic ecosystem. Once this amount of water has been allocated there is no further water available within that watershed.

Historically in Alberta, when this limit is approached, additional water is made available by constructing reservoirs that store water during seasons or years of high flows to be used in seasons or years of low flows. But building reservoirs can be very costly and may have a significant impact on the environment.

At present, the limit of available water has been reached in a number of watersheds, is being approached in others and, as growth continues, will be reached in many of Alberta's watersheds.

During all stages of the consultation on the water strategy, Albertans stated again and again that water conservation must be the emphasis of the water strategy, combined with a focus on getting the most production possible from the water that is already allocated.

Albertans want to know that water taken from the environment is being used efficiently and that the production generated from this water continues to increase before major alternatives such as reservoirs and diversions are implemented.

STRATEGY » Develop and implement a broad-based water conservation program in Alberta.

To achieve the goal of using and re-using water wisely and responsibly, a concerted effort must be focused on researching and implementing new water conservation methods, technologies and tools.

Water users must work in partnership with researchers, industry, governments and sector organizations.

No one single method or approach will improve water conservation for all types of water uses, and conditions and situations within each watershed will dictate where best to focus water conservation efforts in order to achieve the greatest gains in water use efficiency and production.

Therefore, a coordinated effort for investigating and implementing water conservation techniques is a critical component of the provincial water strategy.

draft for
discussion

The water cycle is the process by which water evaporates from oceans and other bodies of water, accumulates as water vapor in clouds, and returns to oceans and other bodies of water as rain and snow, or as run-off from this precipitation, or as groundwater.

ACTIONS

- Develop an innovative and rigorous program for implementing water conservation across all sectors.
- Explore and develop a system of water pricing and polluter charges, as well as other economic tools and incentives to stimulate changes in behaviours and patterns of water use.
- Reduce, with the goal to eliminate, uses for fresh water that remove it from the water cycle.
- Educate Albertans on the importance of water, the need to use it wisely and opportunities for improved efficiencies.

STRATEGY » Set and report on the achievement of water conservation targets in partnership with Watershed Advisory Councils.

Understanding water use, improving water conservation techniques, setting water conservation targets and monitoring achievement of these targets is an important part of a watershed approach to water management.

To ensure Alberta's water is used wisely, targets for water conservation will be set, monitored and reported to Albertans. The targets should include improved efficiency of use or a reduced demand, as well as increased productivity from the water being used.

ACTIONS

- Set water conservation targets for each water use sector in collaboration with sector groups.
- Set water conservation targets for each watershed in collaboration with Watershed Advisory Councils.
- Improve monitoring activities on the use of water in Alberta.
- Report on the achievement of water conservation to Albertans.

STRATEGY » Improve monitoring activities on the use of water in Alberta.

In order to know how efficiently water is being used, the actual amount of water being used must be clearly identified.

One dam^3 is equal to 1000 cubic metres (1,000,000 litres), or about 200,000 gallons.

The amount of water allocated to Albertans in licences and registrations is known but the amount of water *actually* used in any given year is not known. There are over 21,000 licences and 28,000 registrations in Alberta, but the amount of water allocated to individual licenses varies from as little as 1.0 dam^3 to over 900,000 dam^3. There are also many thousands of rural Albertans that use water for household purposes that do not require a license.

draft for discussion

For practical reasons, which water uses will be monitored and how frequently they will be monitored needs to be determined.

ACTIONS

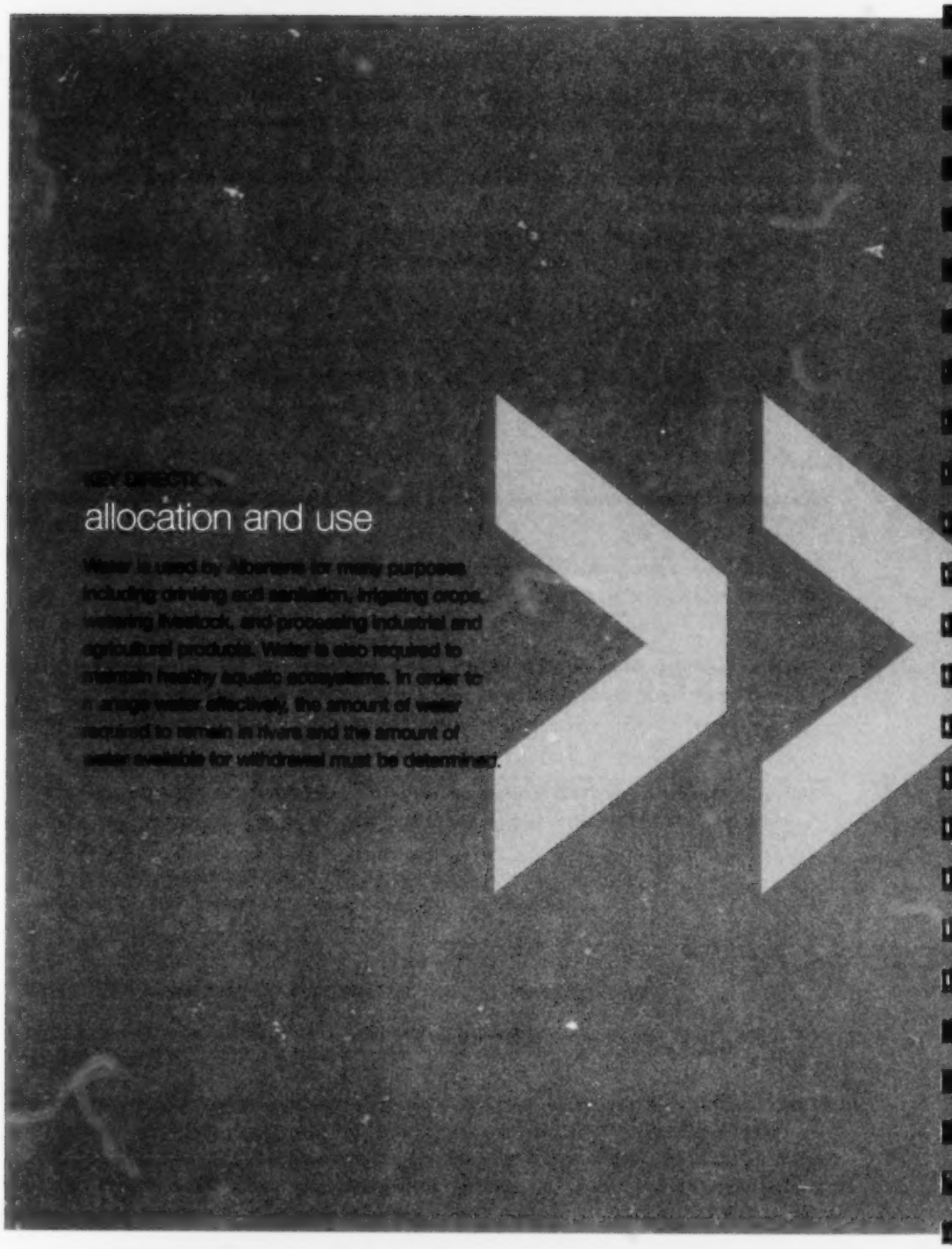
- Implement a water use monitoring program in consultation with stakeholders and water users throughout the province.
- Implement, as part of the water use monitoring program, initiatives to stimulate change in water use, including
  - Water metering for users on municipal systems
  - Water metering for all licensed commercial and industrial users
  - Water metering for all large (size to be determined) agricultural operations
- Design a reporting and data management system that will allow water users to report their actual use in a timely manner. This information will be available to watershed planning initiatives, water conservation researchers and anyone else interested in knowing the amount of water being used in Alberta.

KEY DIRECTION:

allocation and use

Water is used by Albertans for many purposes including drinking and sanitation, irrigating crops, watering livestock, and processing industrial and agricultural products. Water is also required to maintain healthy aquatic ecosystems. In order to manage water effectively, the amount of water required to remain in rivers and the amount of water available for withdrawal must be determined.

draft for
discussion


KEY DIRECTION
allocation and use
Water is used by Albertans for many purposes including drinking and sanitation, irrigating crops, watering livestock, and processing industrial and agricultural products. Water is also required to maintain healthy aquatic ecosystems. In order to manage water effectively, the amount of water required to remain in rivers and the amount of water available for withdrawal must be determined.

draft for discussion

Alberta Environment allocates the water that is available for withdrawal to users. Each user needs to know that they have secure access to their allocated water so that they can make investment decisions.

Society needs to know that water is being used for the most beneficial purpose, but determining the most beneficial use is extremely difficult as there are many economic, social and environmental activities supported by water.

During wet periods, there is plenty of water for all uses. However, during dry periods, there may not be enough water for all uses. It is during these dry periods that there must be an orderly system for determining who receives water and who will be restricted from use.

The effective management of Alberta's water will be achieved through a system that balances the need for secure water supplies while achieving the ideal of most beneficial use.

STRATEGY » Implement, and monitor the application of, water allocation transfers within each river basin in Alberta thereby allowing transfers to facilitate beneficial use.

While the principle of "First-in-time, first-in-right" provides security, on its own it does not ensure the most beneficial use of water, nor does it enable water to move to new uses in the watershed and it does not provide any incentive for water conservation.

"First-in-time, first-in-right" is the principle used to prioritize water rights in Alberta. This principle, which has existed since 1894, means that water rights are prioritized according to the seniority of a licence, regardless of use. The older the licence, the higher the priority.

In 2002, water allocation transfers were authorized in the South Saskatchewan River Basin. These transfers allow all or part of existing water allocations to be transferred to new water users.

It is believed that this system of water transfers will, through market mechanisms, move water to higher value uses. A transfer system will effectively accommodate new users and ensure society's needs can be met. Transfers also provide an incentive to the current licensee to become more efficient, as any reduction in water use is allowed to be transferred to another user, resulting in monetary benefits for water savings.

Implementing water allocation transfers within all river basins in Alberta will provide one method of achieving more beneficial use and serve as an incentive for water conservation.

ACTIONS

- Implement a system of water allocation transfers within all river basins in Alberta.
- Monitor and evaluate the results of water allocation transfers and, if required, recommend changes to the administrative guidelines.

draft for discussion

STRATEGY » Manage groundwater using science-based methods to ensure aquifer sustainability.

Groundwater:
All water under the surface of the ground, whether in liquid or solid state.

Groundwater is used extensively in rural Alberta for domestic, agricultural and petroleum production purposes.

In many areas of the world, groundwater is extracted and used at a greater rate than it is replenished – a practice that is simply not sustainable.

During the public consultation, Albertans stated that groundwater was extremely important to rural Alberta and should be managed in an effective and sustainable manner.

Aquifer:
An underground water-bearing formation that is capable of yielding water.

As each aquifer and its recharge and discharge areas are a watershed in themselves, groundwater must also be managed within a watershed approach.

ACTIONS

- Develop and apply aquifer models to determine the sustainable water withdrawal for priority aquifers in Alberta.
- Continue to use appropriate exploration and testing methods to evaluate individual groundwater use applications where detailed aquifer assessments are unavailable.

STRATEGY » Ensure proper levels of funding to achieve long-term sustainability of Alberta's publicly funded water management infrastructure.

The Province of Alberta owns water management infrastructure that stores and delivers water for Albertans to use. This provincially owned infrastructure includes dams, headworks, canals, lake outlet structures and river works.

The Alberta government also provides funding for the maintenance and rehabilitation of other water infrastructure. This infrastructure includes municipal water treatment and distribution systems, dams, structures, and irrigation and drainage canals.

This infrastructure is very important in providing the quality and quantity of water needed by Albertans.

As with any building or road, water infrastructure must be maintained and rehabilitated within a well-planned program to ensure the infrastructure lasts for a long time. This is known as sustainable asset management.

Without a proper asset management program, future rehabilitation costs could be higher and replacement may be required at an accelerated rate.

An adequately funded and proper asset management program, along with full cost evaluation, will ensure Alberta's water infrastructure is sustainable.

draft for discussion

ACTIONS

- Determine the full cost of water provided by Alberta's water management infrastructure and other water management infrastructure that receives funding support from the provincial government.
- Enhance the capital infrastructure program to upgrade and rehabilitate Alberta's water management infrastructure to ensure its long-term sustainability.
- Enhance the operation and maintenance program to reduce the long-term rehabilitation costs and provide maximum benefits from Alberta's water management infrastructure.

STRATEGY » Continue to manage Alberta's water resources based on the principle of "First-in-time, first-in-right" using all of the tools within the Water Act.

Water has been allocated in Alberta using the principle of "First-in-time, first-in-right" for over 100 years. This system of water allocation provides the security necessary to make business investments and the clarity of rights during dry periods.

ACTIONS

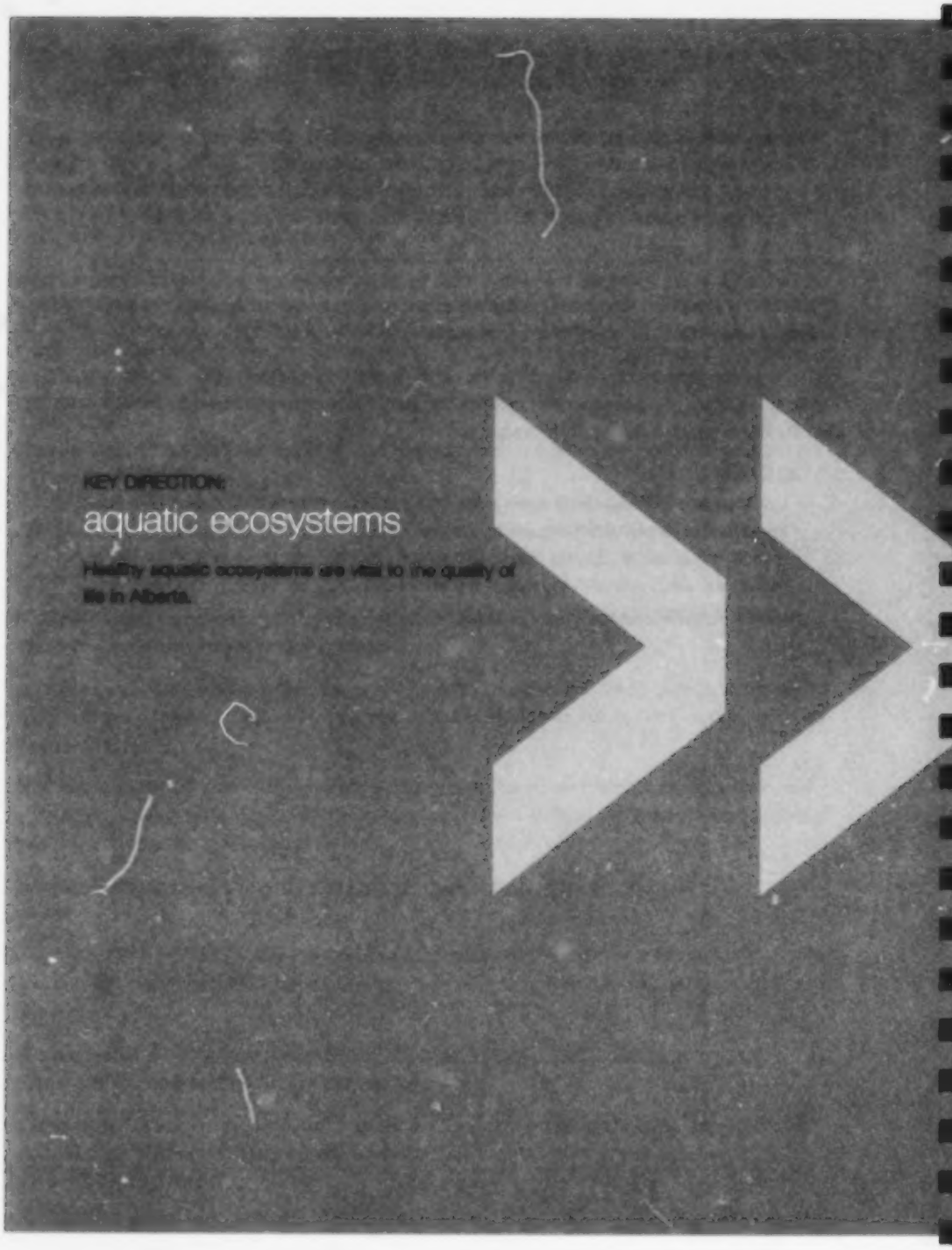
- Continue to allocate water based on the principle of "First-in-time, first-in-right".
- Implement a review of existing water licences to evaluate and ensure that the water allocation reflects actual water use and needs and, where required, use provisions of the *Water Act* to reduce the water allocation to match the actual use.
- Continue to administer the priority of rights during dry periods.

notes

KEY DIRECTION:

Aquatic ecosystems

Healthy aquatic ecosystems are vital to the quality of life in Alberta.


KEY DIRECTION:
aquatic ecosystems
Healthy aquatic ecosystems are vital to the quality of life in Alberta.

People want to fish in rivers and lakes, locate their homes and cottages on the shores of beautiful rivers and lakes, observe and hunt waterfowl, experience natural habitats during family outings, and know that all of this will be available for future generations.

Albertans believe that a balance can be achieved between water used to support the economy and communities and water used to support a healthy aquatic ecosystem. To do so, we must first have a good understanding of what defines a healthy aquatic ecosystem.

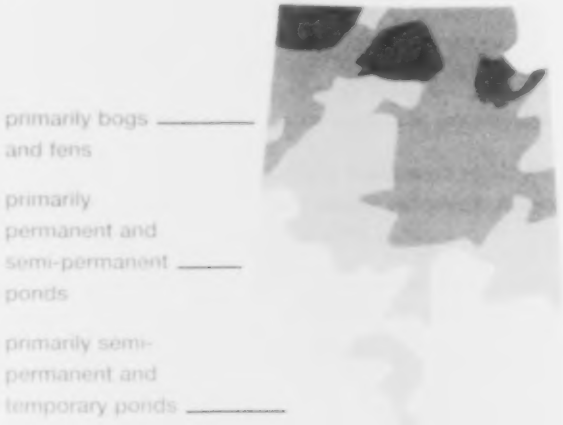
Aquatic Ecosystem: The aquatic area where living and non-living elements of the environment interact. These include rivers, lakes and wetlands, and the variety of plants and animals associated with them.

STRATEGY » Determine the current condition of wetlands in Alberta and establish regional wetland objectives.

During the consultation process, Albertans stated that they want to know more about the role of wetlands, and the role they play within specific watersheds.

ACTIONS

- Complete an inventory of Alberta's wetlands in partnership with the North American Waterfowl Management Plan.


primarily bogs and fens
primarily permanent and semi-permanent ponds
primarily semi-permanent and temporary ponds
wetlands in alberta

Darker shading indicates increased wetland cover

Wetland: An area of land that is saturated with water for all or part of the year. Alberta has five types of wetlands: bogs, fens, swamps, marshes and ponds. Close to 21 per cent of Alberta is covered by wetlands.

The North American Waterfowl Management Plan is an international conservation program that conserves wetlands and upland habitats to help restore waterfowl populations. This plan is considered one of the most successful conservation initiatives in the world.

- Establish a policy for wetlands in Alberta.
- Set regional wetland objectives in partnership with the North American Waterfowl Management Plan, Watershed Advisory Councils and Watershed Protection Groups as appropriate.
- Implement wetland restoration programs in partnership with the North American Waterfowl Management Plan, municipalities and private landowners as appropriate.

draft for discussion

STRATEGY » Determine the ecological requirements of the aquatic ecosystems of Alberta's rivers.

The first step in protecting the aquatic ecosystem is determining the requirements of the aquatic ecosystem.

River reach:
A group of river segments with similar biophysical characteristics.

Within the last 10 years, there have been significant scientific advancements in understanding the requirements of aquatic ecosystems. This only marks the beginning, as a more comprehensive science-based method for determining the requirements of the aquatic ecosystem is needed.

ACTIONS

- Develop a science-based method for determining the ecological requirements of aquatic ecosystems of rivers.
- Develop a science-based method for determining the instream needs of fish without having to undertake detailed assessments on every river reach in Alberta.
- Develop and implement a program for determining the requirements of the aquatic ecosystem by applying these science-based methods on the rivers of Alberta.
- Implement a program, consistent with other water knowledge and research actions, to continuously improve the knowledge and understanding of the aquatic ecosystem and to update the science-based methods.

STRATEGY » Set objectives for aquatic protection in Alberta's rivers after full consideration of ecological requirements, economic values and social values in collaboration with Watershed Advisory Councils.

In order to effectively allocate water from a specific watershed, it is important to first understand how much water is required to support a healthy aquatic ecosystem. If the demand for water exceeds what is required to maintain a healthy aquatic ecosystem, difficult decisions must be made. In some cases, our current level of community and industrial development have caused a loss of aquatic ecosystem function for which it may not be reasonable to fully restore.

As the supply, demand and type of ecosystem varies from watershed to watershed, it is important that the decision-making for water management planning be made at the local level, and be based on the water conservation objectives for the specific watershed.

In setting objectives citizens, communities, industries and governments must work together to strike a balance between ecological, economic and social values.

draft for discussion

ACTIONS

- Set Water Conservation Objectives as part of watershed planning programs, such as in Phase II of the South Saskatchewan River Basin Planning Program.
- Set Interim Water Conservation Objectives for aquatic protection when detailed plan recommendations are not available.
- Apply and administer Water Conservation Objectives as conditions on licenses and approvals issued under the *Water Act* and *Environmental Protection and Enhancement Act*, including new and term (when the term is up for renewal) licenses and approvals and existing licenses that contain the provision for instream objectives.
- Establish, as appropriate, operating procedures for Alberta's water infrastructure to achieve the Water Conservation Objectives.
- Stop issuing new water allocations when Water Conservation Objectives would be compromised.
- Respect existing rights, while identifying opportunities to restore the health of river reaches, where Water Conservation Objectives and aquatic protection have been compromised.

A water conservation objective is defined in Alberta's *Water Act* as the amount and quality of water needed to protect a natural water body or its aquatic environment.

STRATEGY » Monitor and report on the health of Alberta's aquatic ecosystems.

Reporting on the health of the aquatic ecosystem is a complex process, as there are many parameters that influence the diverse ecosystems of Alberta's lakes, rivers and wetlands. These parameters include the amount of water in a lake, river or wetland at any time of the year, the quality of the water and the biological components.

Much of this information is also required for many other water management decisions such as water supply and allocation, drinking water quality and general water quality.

This inter-relationship emphasizes the need to have fully integrated monitoring and reporting systems.

ACTIONS

- Design and implement a system for monitoring and tracking the condition of Alberta's aquatic ecosystems.
- Design and implement an information management system that will make the aquatic ecosystem information on rivers, lakes and wetlands available to those making water management decisions.
- Report the condition of Alberta's aquatic ecosystems as part of the state of the watershed reporting to be undertaken in partnership with the Watershed Advisory Councils.

draft for discussion

STRATEGY » Determine the aquatic ecosystem requirements of lakes as needs emerge.

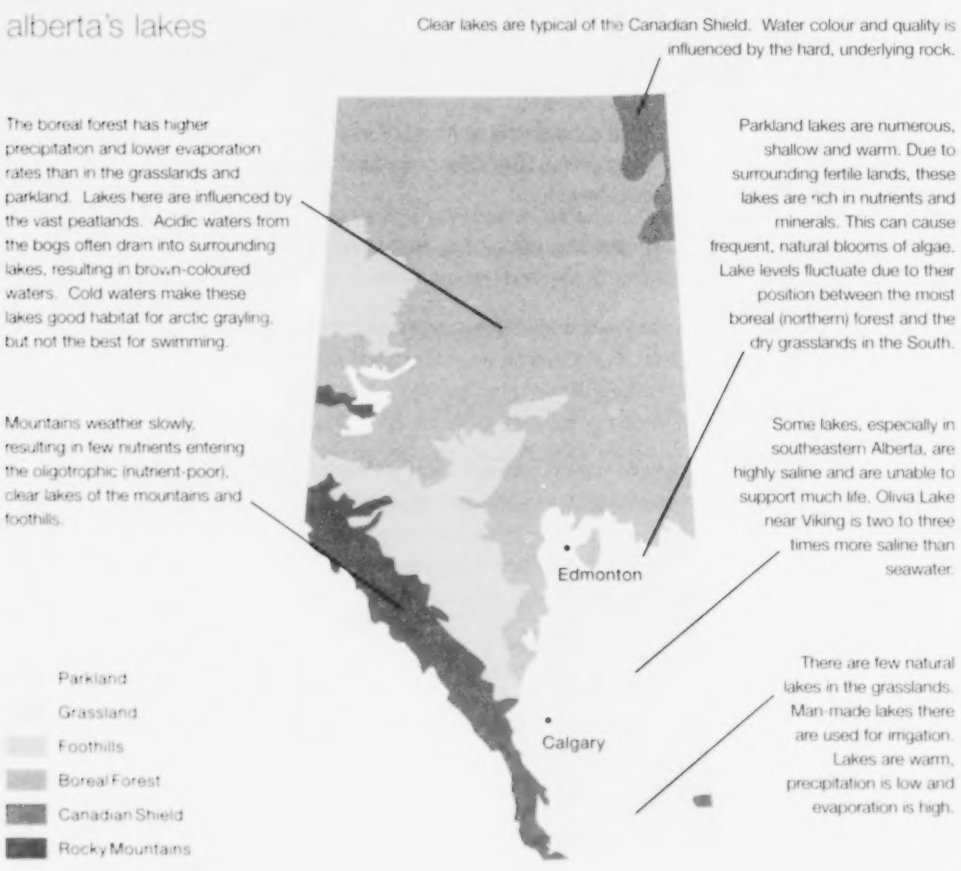
Each of the many lakes in Alberta supports a unique aquatic ecosystem, and each lake has different activities and demands that can affect that ecosystem.

The requirements of each lake's aquatic ecosystem and watershed must be addressed as needs emerge.

ACTIONS

- Identify which lakes have a priority for determining their aquatic ecosystem requirements, in collaboration with Watershed Advisory Councils and Watershed Protection Groups.
- Develop and apply a science-based method for determining the ecological requirements of aquatic ecosystems of lakes.

alberta's lakes


Clear lakes are typical of the Canadian Shield. Water colour and quality is influenced by the hard, underlying rock.
The boreal forest has higher precipitation and lower evaporation rates than in the grasslands and parkland. Lakes here are influenced by the vast peatlands. Acidic waters from the bogs often drain into surrounding lakes, resulting in brown-coloured waters. Cold waters make these lakes good habitat for arctic grayling, but not the best for swimming.
Parkland lakes are numerous, shallow and warm. Due to surrounding fertile lands, these lakes are rich in nutrients and minerals. This can cause frequent, natural blooms of algae. Lake levels fluctuate due to their position between the moist boreal (northern) forest and the dry grasslands in the South.
Mountains weather slowly, resulting in few nutrients entering the oligotrophic (nutrient-poor), clear lakes of the mountains and foothills.
Some lakes, especially in southeastern Alberta, are highly saline and are unable to support much life. Olivia Lake near Viking is two to three times more saline than seawater.
Edmonton
Calgary
There are few natural lakes in the grasslands. Man-made lakes there are used for irrigation. Lakes are warm, precipitation is low and evaporation is high.
Parkland
Grassland
Foothills
Boreal Forest
Canadian Shield
Rocky Mountains

draft for discussion

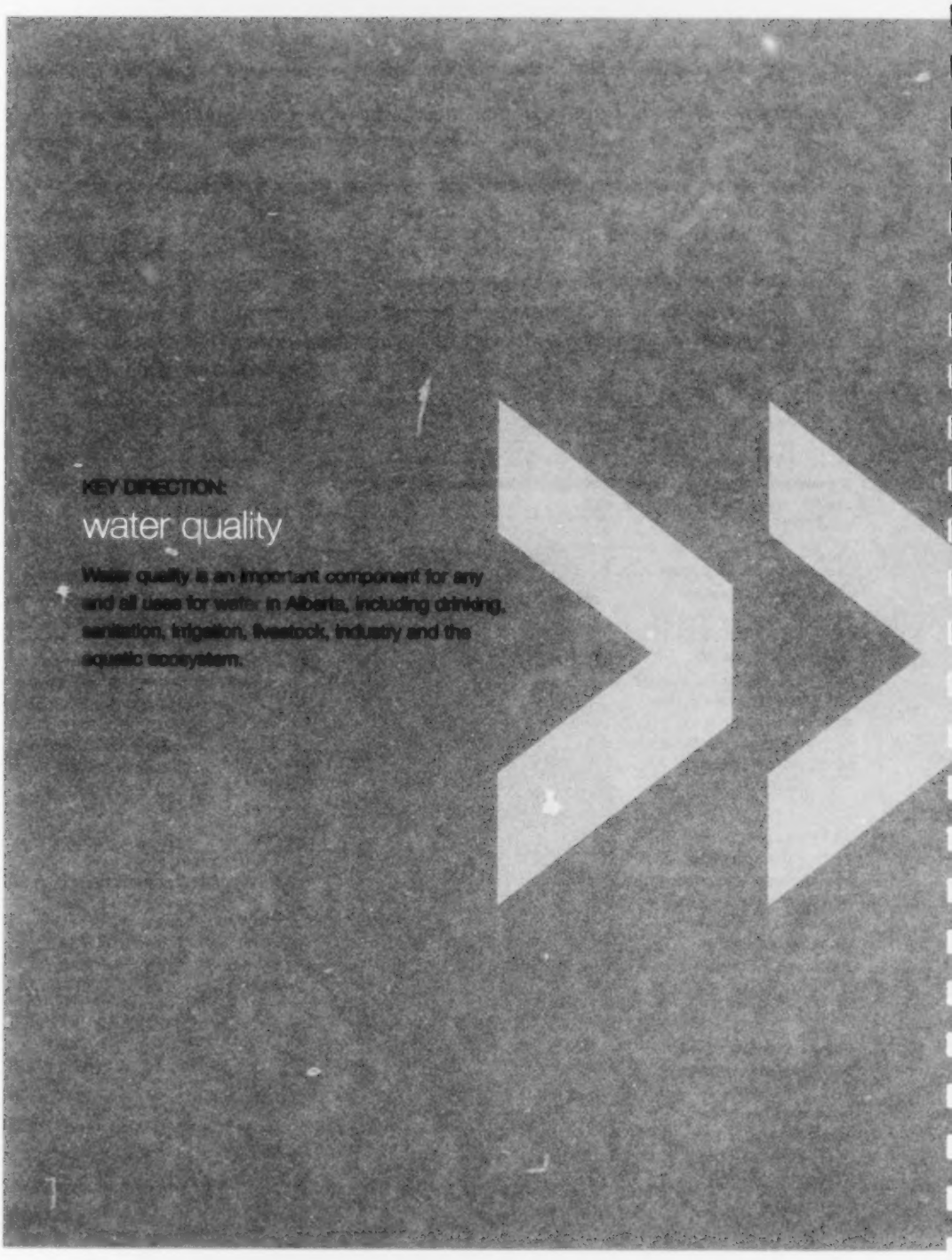
notes

KEY DIRECTION:

water quality

Water quality is an important component for any and all uses for water in Alberta, including drinking, sanitation, irrigation, livestock, industry and the aquatic ecosystem.

draft for
discussion


KEY DIRECTION:
water quality
Water quality is an important component for any and all uses for water in Alberta, including drinking, sanitation, irrigation, livestock, industry and the aquatic ecosystem.

Albertans are concerned about the risks to water quality associated with high levels of development, both on surface and groundwater.

STRATEGY » Establish a Water Quality Assurance Initiative for Alberta's surface and groundwater.

Understanding the factors that influence water quality will allow Albertans to make wise decisions about how activities and allocations may affect water quality.

While many government departments, municipalities, industries, research institutions and local interest groups gather information about water quality, a coordinated effort to compile and use all this information to support a strong water quality assurance initiative is required.

With good data, specific objectives for water quality can be established within watersheds and provide an understanding of the limits to the amount of activity that can be sustained by a watershed.

ACTIONS

- » Review all current water quality monitoring within watersheds and adjust as necessary to achieve a watershed approach to water quality.
- » Work with Watershed Advisory Councils to identify water quality issues and recommend actions for source water protection as part of the watershed approach.
- » Set water quality objectives as part of watershed planning programs.
- » Increase water quality monitoring in development-intense areas.

STRATEGY » Undertake land-based activities in a manner to protect watersheds.

Human activities have an impact on the quality of Alberta's river, lakes, wetlands and groundwater.

Run-off from city streets, pesticides and fertilizers from farmlands and lakeshore cottage developments, manure from livestock and runoff from industrial developments all affect water quality.

Pollution from these sources can be reduced, if not prevented, by planning the developments with pollution prevention in mind and by implementing best management practices in the operations of these activities.

All Albertans have a shared responsibility to reduce their impact on water quality, and recognize the potential effects of land-based activities on water quality, so that responsible decisions during initial planning and development stages ensure water quality protection.

ACTIONS

- Work with individual landowners and developments to implement local water quality protection solutions, in collaboration with Watershed Advisory Councils, Watershed Protection Groups, the Alberta Environmentally Sustainable Agriculture Council and municipalities.
- Continue to address potential water quality impacts within conditions of approvals for individual developments under the *Environmental Protection and Enhancement Act*.
- Educate individuals with private drinking water systems to protect their water source by managing their land-based activities.

STRATEGY » Adopt a pollution prevention approach and strive for "zero discharge" of contaminants.

Pollution prevention has been, and will continue to be, the foundation for water quality protection. Many large municipal wastewater treatment plants have been upgraded with the primary focus of reducing the amount of pollution discharged to Alberta's rivers. There have also been extensive efforts by many industries in Alberta to improve their effluent treatment processes.

Continued leadership from industry, agriculture and municipal sectors will move Alberta towards zero discharge of contaminants.

Reducing pollution at its source will allow for increased development with no increased impact on Alberta's water quality.

ACTIONS

- Enhance pollution prevention initiatives to minimize pollution at source.
- Raise existing standards for effluent discharge, and strive for "zero discharge" of contaminants.

STRATEGY » Monitor and report on the quality of water in Alberta's watersheds.

Gathering information about the condition of water quality in Alberta and making this information available to Albertans is vital to our ability to manage water quality.

Many parameters can be measured to determine the condition of water quality. Because each watershed is unique, monitoring systems must be designed specific to each watershed.

The data from this monitoring can then be evaluated and compiled for those making water quality decisions. Electronic systems that can monitor and report water quality data is an important part of making this data available to Albertans.

ACTIONS

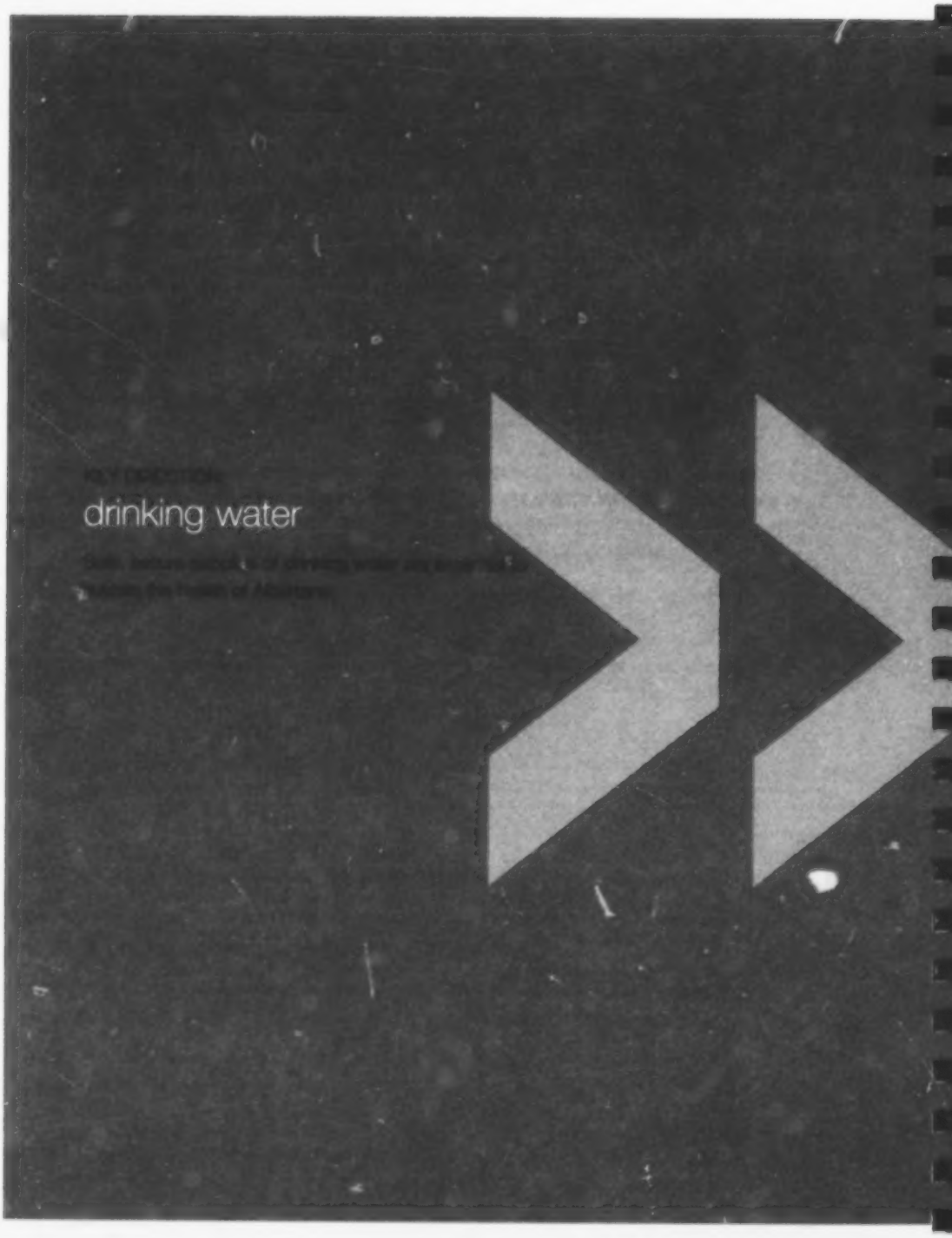
- Design and implement a system for monitoring and tracking water quality in Alberta's watersheds.
- Design and implement an information management system that will make water quality information on rivers, lakes, wetlands and groundwater available to anyone that needs it for making effective water management decisions.
- Report the condition of Alberta's water quality as part of state of the watershed reporting, to be undertaken in partnership with the Watershed Advisory Councils.

KEY DIRECTION:

drinking water

Safe, secure supplies of drinking water are essential to sustain the health of Albertans.

draft for
discussion



draft for discussion

Drinking water safety depends on a number of key elements:

- Good water supply and treatment systems
- Proper operation and maintenance of waterworks systems
- Comprehensive monitoring for drinking water quality
- Appropriate steps for correction and enforcement

Alberta's current drinking water program addresses all of these elements.

In fact, Alberta's treatment performance standards are among the most stringent in Canada.

Approximately 2.5 million Albertans receive their drinking water from municipal systems approved by Alberta Environment, while another 600,000 receive their water from private systems (e.g. wells, dugouts, cisterns), or systems operated by First Nations.

Increasing population, development, and costs are challenges facing providers of safe drinking water. Small and private water systems will face the largest challenges relating to operational expertise and economics of scale.

regulated systems

STRATEGY » Determine the full cost of drinking water so that consumers and governments can make informed decisions.

Aging infrastructure must be maintained, upgraded to meet new standards, or replaced.

Full-cost accounting for the delivery of safe drinking water is needed to ensure that adequate resources are available to sustain the source and the infrastructure required to deliver safe drinking water.

Full-cost accounting is an effective tool for understanding the resources needed to provide long-term quality service. Additional benefits include:

- Knowledge of the full cost of treatment, testing, monitoring and distribution will promote consumer awareness of the true value of drinking water.
- Consumer awareness will enhance conservation initiatives.
- Increased awareness and understanding of asset value and condition will assist operators with planning for future upgrades and replacements.

ACTIONS

- Require waterworks system owners in Alberta to prepare a financial plan to account for the full cost of providing safe drinking water.

STRATEGY » Continue to adopt drinking water standards and monitoring processes that protect the health of Albertans.

Since 1974, the provincial government has provided funding assistance to municipalities for the construction of water supply and treatment facilities, resulting in Alberta having the highest overall level of water treatment in Canada. The Alberta government and drinking water providers will continue to invest in waterworks infrastructure to achieve provincial standards.

However, increasing activity in our watersheds, and the need to minimize risk and achieve higher standards of treatment for certain pathogens and chemical parameters, is challenging the security of our sources and effectiveness of our treatment facilities.

ACTIONS

- Continue to adopt drinking water standards that protect the health of Albertans.
- Complete a comprehensive risk assessment of smaller waterworks systems to determine needs for upgrading, improving or consolidating operations or providing alternatives.
- Invest in water treatment infrastructure to achieve provincial drinking water standards as required by the results of the risk assessment.
- Enhance monitoring systems for drinking water and implement real-time process control where feasible.
- Implement continuous monitoring of fluoride, chlorine residuals, and turbidity.

STRATEGY » Improve risk management of potential threats to drinking water safety.

Alberta is the only province in Canada that requires stricter rules for microbial quality of drinking water than those outlined in *Health Canada's Guidelines for Canadian Drinking Water Quality*. In addition to its comprehensive approvals and standards, Alberta also has a communication and action protocol in place.

draft for discussion

This protocol is designed to ensure that Alberta Environment, Regional Health Authorities, public health laboratories, and the owners and operators of municipal water treatment systems can deal effectively with emergency situations, such as failed bacteriological tests.

In order to continue leadership in this area, Alberta will continue to monitor and improve these systems to offer the highest level of assurance to its citizens.

ACTIONS

- Enhance the ability of the provincial laboratory for public health to conduct bacteriological testing of drinking water for both regulated and non-regulated systems.
- Develop methods for tracking incidences of water-borne illness associated with drinking water provided from municipal and private systems to ensure that any trends are detected and responded to.
- Enhance the capabilities of regional health authorities to implement emergency response protocols.
- Provide an education and abatement program for approved waterworks systems to ensure operators have information needed to make good decisions in the management and operation of their systems.

Why does drinking water need to be treated?

The main reason for treating or disinfecting public water supplies is to kill pathogens, or disease-causing organisms transmitted by water. Some examples of water-borne diseases and disease causing organisms are cholera, typhoid, *E.Coli*, *Giardia* and *Cryptosporidium*.

Alberta Environment regulates public waterworks systems in the province in accordance with the Alberta *Environmental Protection and Enhancement Act*. The department works closely with Alberta Health and Wellness and Regional Health Authorities to ensure Albertans on municipal water systems enjoy high quality drinking water.

STRATEGY » Support and facilitate regional delivery of drinking water through partnerships with the private sector and large municipalities.

A risk assessment of approved waterworks systems will examine the long-term feasibility of operating smaller, higher risk water systems.

The assessment, to be commissioned by Alberta Environment, will look at reducing the number of these small, approved systems through opportunities to partner with the private sector and larger municipalities as part of a regional operation.

draft for discussion

Regional operations can include a regional commission, where treated water is piped from one location to a number of user municipalities, or a scenario where a larger utility or municipality operates a number of smaller individual water treatment facilities within a defined region where a number of facilities are connected electronically, and monitored remotely. Either way, risks to consumers are reduced and service is improved.

Where it is determined that providing quality drinking water is a problem and concern, bulk potable water stations should be available for public use.

ACTIONS

- Use information from the assessment of approved waterworks systems to identify and encourage opportunities for regional delivery of drinking water.

non-regulated systems

STRATEGY » Provide accurate, accessible and clear information to Albertans on private systems so that they can make informed decisions on how to assure the quality and safety of their drinking water.

Many Albertans receive their drinking water from private supplies such as wells, dugouts, or cisterns.

These types of systems do not have regulated monitoring and reporting requirements, so system owners living on farms or acreages do not have the benefit of compliance checks and certified operation.

Additional actions and measures are needed to provide a higher level of assurance and safety to citizens receiving their water through private systems.

ACTIONS

- Provide an education and abatement program to ensure that private system owners have the information needed to make good decisions in the management of their systems.
- Establish a website to inform and educate Albertans on key facts and issues pertaining to their drinking water systems.

draft for
discussion

notes

measuring success

Although implementation of the provincial water strategy will involve many partners, the Government of Alberta remains accountable to assure Albertans that our desired outcomes - safe, secure drinking water supply; healthy aquatic ecosystems; reliable, quality water supplies for a sustainable economy; and the knowledge to make effective water management decisions - are being met.

The final *Water for Life* strategy, to be released in Fall 2003, will include a framework for accountability to define, monitor, measure and evaluate our success, based on the following principles:

- Clear roles and responsibilities for all Ministries and partners
- Clear performance expectations for all strategies
- Credible and timely reporting on progress by the government and its partners
- Reasonable review of performance and adjustment of strategies as required

Specific performance measures that support these principles, and directly measure success on specific outcomes, will be developed in partnership with the Provincial Advisory Council, as part of the implementation of specific strategies and actions.

next steps

The Government of Alberta strongly believes responding to the province's growing water needs will require the expertise, innovation and insights of all Albertans.

The *Water for Life: Alberta's Strategy for Sustainability* draft for discussion represents the recommendations Albertans provided to the Alberta government during public consultations last spring. The strategy outlines practical and effective approaches to manage Alberta's water needs, while maintaining the province's economic prosperity, and addressing environmental concerns.

Over the next two months, the Alberta government will meet with stakeholders who attended the Minister's Forum on Water to shape elements of the plan and champion initiatives within the eight key directions.

The government of Alberta is also inviting feedback from Albertans on the strategies outlined in this draft for discussion. Some areas for consideration when providing feedback, include:

- Is the watershed approach the right direction for water management in the province?
- Are advisory councils at a provincial and watershed level an effective mechanism for moving forward and achieving the outcomes as proposed by the draft strategy?
- How can the Alberta government most effectively provide support to these advisory councils as well as to community-based Watershed Protection Groups?
- How important are research and education programs to the successful implementation of a provincial water strategy?
- What elements are essential to include in a broad-based water conservation program? Who should participate in developing such a program?
- Is it reasonable to set water conservation targets by sector and within individual watersheds?
- Are water allocation transfers an effective tool for achieving beneficial use of water? Are there other tools that should be investigated and pursued?
- Is there support for aquatic ecosystem protection as described in the draft strategy?
- Who should be involved in setting Water Conservation Objectives?
- How can water quality information be reported most effectively to Albertans?
- Is there support for establishing partnerships for the regional delivery of drinking water?

Anyone interested in providing feedback can go on-line at www.waterforlife.gov.ab.ca or call 310-4455 (toll-free in Alberta) for an information package.

The deadline for input on this strategy is May 31, 2003.

draft for
discussion

glossary

draft for discussion

Allocation » When water is redirected for a use other than for household purposes, it is referred to as an allocation. Agricultural, industrial and municipal water users apply to Alberta Environment for a licence to use a set amount of water. This water licence outlines the volume, rate and timing of a diversion of water.

Approval » An approval provides authority for constructing works or for undertaking an activity within a water body. The approval includes conditions under which the activity can take place.

Aquatic ecosystem » An aquatic area where living and non-living elements of the environment interact. These include rivers, lakes and wetlands, and the variety of plants and animals associated with them.

Aquifer » An underground water-bearing formation that is capable of yielding water. Aquifers have specific rates of discharge and recharge. As a result, if groundwater is withdrawn faster then it can be recharged, the underground aquifer cannot sustain itself.

Consumptive use » Water taken from a source that is not entirely or directly returned to that source. For example, if water is taken from a lake to feed cattle, it is considered a consumptive use of water.

***Cryptosporidium* »** A microorganism commonly found in lakes and rivers that is highly resistant to disinfection. *Cryptosporidium* causes gastrointestinal illness, with symptoms that include diarrhea, nausea, and/or stomach cramps. People with severely weakened immune systems are likely to have more severe and persistent symptoms.

dam³ » A measurement used to describe large volumes of water. One dam³ is equal to 1000 cubic metres (1,000,000 litres) or about 200,000 gallons.

Diversion of water » The impoundment, storage, consumption, taking or removal of water for any purpose. This does not include the taking or removal for the sole purpose of removing an ice jam, drainage, flood control, erosion control or channel realignment.

Domestic water use » Water used for drinking, cooking, washing and yard use. A very small percentage of the water used in this province is used for domestic purposes.

Drinking water » Water that has been treated to provincial standards and is fit for human consumption.

***Environmental Protection and Enhancement Act* »** This is provincial legislation that takes an integrated approach to the protection of Alberta's air, land and water. One of the Act's cornerstones is the guarantee of public participation in decisions affecting the environment. This public involvement includes increased access to information, participation in the Environmental Assessment and Approval Processes and the right, when directly affected, to appeal certain decisions.

First-in-time, first-in-right » The principle used to prioritize water rights in Alberta. This principle, established in 1894, means that water rights are prioritized according to how senior the licence is, regardless of its use. The older the licence, the higher the user is on the priority list.

***Giardia* »** A micro-organism frequently found in rivers and lakes, which, if not treated properly, may cause diarrhea, fatigue, and cramps after ingestion.

Groundwater » All water under the surface of the ground whether in liquid or solid state. It originates from rainfall or snowmelt that penetrates the layer of soil just below the surface. For groundwater to be a recoverable resource, it must exist in an aquifer. Groundwater can be found in practically every area of the province, but aquifer depths, yields and water quality vary.

Habitat » This term used to describe the natural home of a living organism. The three components of wildlife habitat are food, shelter and water.

Household purposes » Water used for human consumption, sanitation, fire prevention and watering animals, gardens, lawns and trees.

Hydrologic cycle (water cycle) » The hydrologic cycle is the process by which water evaporates from oceans and other bodies of water, accumulates as water vapor in clouds, and returns to oceans and other bodies of water as rain and snow, or as run-off from this precipitation or as groundwater.

Inorganic contaminants » Mineral-based compounds such as metals, nitrates, and asbestos. These contaminants are naturally occurring in some water, but can also get into water through farming, chemical manufacturing, and other human activities.

Instream needs » This is the scientifically determined amount of water, flow rate or water level that is required in a river or other body of water to sustain a healthy aquatic environment or to meet human needs such as recreation, navigation, waste assimilation, or aesthetics. An instream need is not necessarily the same as the natural flow.

Irrigation district » A water delivery system for a given region. In Alberta, there are 13 irrigation districts used for agriculture, supplying about 50 communities with water for domestic use.

Micro-organisms » Also known as microbes, tiny living organisms that can be seen only with the aid of a microscope. Some micro-organisms can cause acute health problems when consumed in drinking water.

Natural flow » Natural flow is the flow in rivers that would have occurred in the absence of any man-made effects.

Non-consumptive use » A use of water in which all of the water used is directly returned to the source from which it came. For example, water used in the production of hydroelectricity is a non-consumptive water use.

Non-point source pollution » Non-point source pollution is contamination that cannot be identified as originating from one site. This type of pollution comes from a larger area of land and is carried by run-off and groundwater.

Organic contaminants » Carbon-based chemicals, such as solvents and pesticides, which can get into water through runoff from cropland or discharge from factories.

Point source pollution » This is pollution that originates from an identifiable cause or location, such as a sewage treatment plant or feedlot.

Potable water » Water that is fit for human consumption, but has not been treated.

Raw water » Water in its natural state, prior to any treatment for drinking.

Reservoir » A man-made lake which collects and stores water for future uses. During periods of low river flow, reservoirs can release additional flow if water is available.

Riparian area » The area along streams, lakes and wetlands where water and land interact. These areas support plants and animals, and protect aquatic ecosystems by filtering out sediments and nutrients originating from upland areas.

River basin » An area of land drained by a river and its associated streams or tributaries. Alberta's *Water Act* identifies seven major river basins within the province:

- Peace/Slave River Basin
- Athabasca River Basin
- North Saskatchewan River Basin
- South Saskatchewan River Basin
- Milk River Basin
- Beaver River Basin
- Hay River Basin

River reach » A group of river segments with similar biophysical characteristics. Most river reaches represent simple streams and rivers, while some river reaches represent the shorelines of wide rivers, lakes and coastlines.

Run-off » This refers to water that moves over the surface of the ground. Run-off collects sediments and contaminants as it moves from higher elevations to lower elevations.

Surface water » Most Albertans get their water from surface water sources such as lakes and rivers. The run-off from rain and snow renews our surface water sources each year. If the demand for surface water is higher than the supply, there will not be enough available to balance the needs of Albertans, the economy and the environment.

Turbidity » A measure of the clarity of water. Turbidity in water is caused by the presence of suspended matter such as clay, silt, algae and other microbiological particles. Murky water is said to be "turbid".

Water Act » In Alberta, the *Water Act* is used to protect the quality of water and to manage its distribution. This legislation regulates all developments and activities that might affect rivers, lakes and groundwater.

Water allocation transfer » A water allocation transfer occurs after the holder of an existing water withdrawal licence agrees to provide all or part of the amount they are allocated to another person or organization. Alberta Environment must approve any transfer of this kind. When this occurs, the allocation is separated from the original land, and a new licence, with the seniority of the transferred allocation, is issued and attached to the new location. Under the *Water Act*, Alberta Environment can place conditions on the new licence. Water allocation transfers can occur only if authorized under an approved water management plan, or by the Lieutenant Governor in Council.

Water body » Any location where water flows or is present, whether or not the flow or the presence of water is continuous, intermittent or occurs only during a flood. This includes, but is not limited to, wetlands and aquifers.

Water conservation » Conservation is the planned protection, improvement and wise use of natural resources. It includes controlling, protecting and managing water.

Water conservation objective » As outlined in Alberta's *Water Act*, a water conservation objective is the amount and quality of water necessary for the protection of a natural water body or its aquatic environment. It may also include water necessary to maintain a rate of flow or water level requirements.

draft for discussion

Water licence » A water licence provides the authority for diverting and using surface water or groundwater. The licence identifies the water source; the location of the diversion site; an amount of water to be diverted and used from that source; the priority of the "water right" established by the licence; and the condition under which the diversion and use must take place.

Water management plan » *Alberta's Framework for Water Management Planning* outlines the process for water management planning and the components required for water management plans in the province. It applies to all water bodies, including streams, rivers, lakes, aquifers and wetlands.

Water power development » The works required for the storage or diversion of water for the production of power. A water power development usually consists of three main components: a man-made dam across a river; a water storage reservoir; and a hydroelectricity generation plant.

Water well » An opening in the ground, whether drilled or altered from its natural state, that is used for the production of groundwater, obtaining data on groundwater, or recharging an underground formation from which groundwater can be recovered. By definition in the provincial *Water Act*, a water well also includes any related equipment, buildings, and structures.

Watershed » A watershed is the area of land that catches precipitation and drains into a larger body of water such as a marsh, stream, river or lake.

Watershed approach » A watershed approach focuses efforts within watersheds, taking into consideration both ground and surface water flow. This approach recognizes and plans for the interaction of land, waters, plants, animals and people. Focusing efforts at the watershed level gives the local watershed community a comprehensive understanding of local management needs, and encourages locally led management decisions.

Wetland » A wetland is an area of land that is saturated with water for all or part of the year. Alberta has five types of wetlands: bogs, fens, swamps, marshes and ponds. Close to 21 per cent of Alberta is covered by wetlands.

printed on recycled paper
Alberta
GOVERNMENT OF ALBERTA